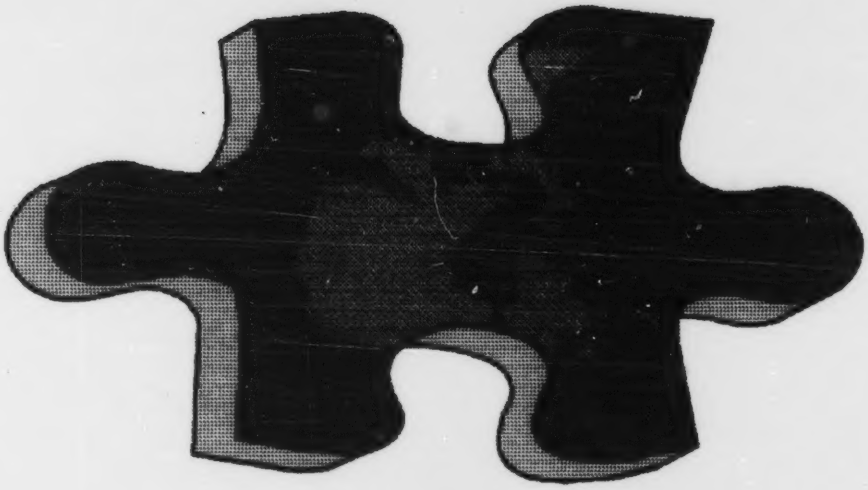
# CANADA'S NATIONAL REPORT



United Nations Conference on
Environment and Development
Brazil, June 1992

Canada

August 1991

CANADA'S GREEN PLAN

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# PREFACE

Many countries were born of their history, but Canada was born of its geography. When the first European settlers arrived, they found an aboriginal population living in harmony in a rugged northern land. The lives of aboriginal peoples were intimately connected with the environment and their survival required a harmonious relationship with the natural elements. European settlers quickly learned that they too had to adapt to the environment in order to survive.

European exploration followed the course of the waterways throughout the continent. Settlement patterns that followed were strongly influenced by these same rivers and lakes and the many mountain barriers. Our early industries and commerce were built on Canada's vast environmental wealth.

The art, music and culture of Canadian expression has long reflected the basic natural elements of this country's environment. Our best loved painters, the Group of Seven, immortalized the barren rocky islands and stark scenery of what is probably Canada's dominant geographical feature — the Canadian Shield. In particular they cherished the special places of Georgian Bay and Algonquin Park, Canada's oldest provincial park. Our favourite poets and writers, Margaret Atwood, Gilles Vigneault and W.O. Mitchell, among others, pit their characters against harsh Canadian winters and wild prairie skies. Canada's flag is one of the only flags in the world representing a natural element — a single maple leaf. It is little wonder that when acid rain threatened the very lakes painted by the Group of Seven and the maple trees whose leaves herald our country in stylized form that Canadians reacted strongly. For most Canadians, the environment is not something outside of themselves. It is part of their identity. It is what makes them Canadian.

As stewards of a vast and beautiful land, and as a people intimately connected to the environment, Canadians are aware of their environmental responsibilities. Our economic activities must not jeopardize the health and productivity of the environment upon which we all depend. In short, we must pursue sustainable development.

Canada's Green Plan puts Canada firmly on the path toward sustainable development. It provides a long-term strategy for making the fundamental changes that will be needed to bring environmental considerations into the mainstream of the day-to-day decision-making of Canadians. Canada's Green Plan also recognizes the need to accelerate international progress on the environment. It is imperative that we strengthen international co-operation and forge new international partnerships so that we can meet the environmental challenges of the 1990s and beyond.

Canada believes that the United Nations Conference on Environment and Development, or the Earth Summit, offers the nations of the world a rare and valuable opportunity to accelerate and strengthen co-operative global efforts. For the first time in twenty years, the heads of government from developed and developing nations will meet to discuss issues of common concern and to build new and stronger partnerships in the pursuit of global sustainable development. In the words of Maurice Strong, the Secretary-General of the Conference, "the primary goal is to lay the foundation for a global partnership between developing and more industrialized countries, based on mutual need and common interests, to ensure the future of the planet".

It is an ambitious goal. The issues are complex and there will be no easy or quick solutions. But we are optimistic that the nations of the world are equal to the challenge.

## INTRODUCTION

### *From Stockholm to Brazil*

In June 1972, the United Nations Conference on the Human Environment was held in Stockholm, Sweden, to stimulate international interest and awareness of global and international environmental issues. Its further purpose was to begin the process of developing solutions based on a new and better understanding of the issues, in part brought about by the conference.

One of the most important ideas that was examined and strengthened by the conference, was that the environment and the economy are, in simple terms, but two sides of the same coin. Now, more than ever, we have come to accept this idea as fundamentally sound. Without a clean environment and a healthy storehouse of environmental resources, we cannot expect to have a strong and competitive economy. At the same time, evidence is mounting that without a strong economy, we cannot hope to have the high level of social or environmental well-being that people strive for.

Much of the credit for increasing the world-wide understanding of this idea must go to the work of the World Commission on Environment and Development, chaired by Gro Harlem Brundtland, currently the Prime Minister of Norway. In its final report, "Our Common Future", the Commission set out the philosophy of merging environmental and economic goals for the better of both the global environment and its inhabitants. Sustainable development, as it has come to be known, offers genuine hope to the world to meet these two fundamental goals.

In June 1992, about twenty years after the historic Stockholm conference, the United Nations Conference on Environment and Development (UNCED) will be held in Brazil. Up to 160 heads of government, representing the entire United Nations membership, will gather to discuss the critical relationship between the environmental and economic health of the planet. Leaders will work together at UNCED to chart a global course for sustainable development, and will focus debate on the major changes required for the future. The UNCED Secretariat asked participating countries to prepare a number of important products for the conference and for the process leading up to it. One of these is the National Report.

### *How Canada's National Report Was Prepared*

To help countries in the preparation of their national reports, the Secretary General of UNCED released PC-8, *Guidelines for the Preparation of the National Report*. PC-8 asked each country to provide specific state of the environment and natural resources information, as well as a size-up of current socio-economic conditions. It also called for participating countries to take a hard look at themselves in terms of their progress in merging socio-economic and environmental factors into the workings of their national economies. Finally, the UNCED Secretariat stressed the importance of developing multi-stakeholder participatory processes to put the reports together.

Canada signalled its interest and commitment to a participatory process in the creation of its national report at the first meeting of the UNCED Preparatory Committee in August 1990. It was clear that, to be a truly national report, as many interested sectors as possible within Canada should be involved in its development.

Consultation with the public on environmental policy has become an important part of the policy-making process in Canada. In August 1990, one of the largest public consultations ever held in Canada was completed. Held to help develop Canada's Green Plan, the federal government's sustainable development policy and action plan, over 10,000 Canadian men and women representing every sector of Canadian society made their views known to the government. Consultations are underway on a wide variety of issues at the provincial and territorial levels as well.

Challenging time constraints, combined with the fact that many Canadians have already made their views on sustainable development known, ultimately dictated that a public consultations exercise to develop Canada's National Report would not be undertaken at this time. It was decided, therefore, to create a National Report Steering Committee to seek input from a variety of sectors as well as comments on the report as it developed. The make-up of the Steering Committee can be found in the Annex.

The Steering Committee's goal was to produce a balanced report that would enable the rest of the world to understand Canada's successes along with the challenges that lie ahead. With this goal in mind, it is hoped that the document will prove to be useful to other nations and to the international community collectively in meeting the objectives of UNCED.

### *Canada's National Report*

Canada's National Report provides the world with a "snapshot" of how far the people of Canada have come in making sustainable development a reality in this country. Looking back over the 20 years since Stockholm, it is evident that we have come a very long way indeed. In fact in some respects, it is with some relief that the long road that we have already travelled is behind us. In 1972, there were many important players in the Canadian economy who did not consider pollution or other environmental problems to be significant concerns. Now, it is a rare Canadian who does not believe that we must squarely face our environmental challenges. Most also believe that we must address them within the workings of our economy. This is a major accomplishment, and has established the groundwork for real and substantive progress.

And real success has been achieved in a number of important areas. For instance, although not totally resolved, the serious problem of acid rain is coming under control. However, this is not to say we have solved all of our problems. We have a challenging list of pollution and resource utilization problems that demand attention. These concerns range from localized problems such as urban smog and polluted rivers, to the presence of persistent toxic substances in our ecosystems, from unsustainable resource use practices in some forestry, agriculture and high seas fishery operations, to global problems such as depletion of the ozone layer and global warming.

There is good reason to be hopeful. Attitudes in Canada have changed; Canadian men and women from all sectors are already working on these issues in co-operative, constructive ways. Some solutions will require people to make tradeoffs between important goals, including social and economic goals, and at times compromises will have to be forged. But the will of Canadians is there to protect the environment and maintain a healthy, competitive economy. And that is probably the most important thing of all. Canadians want change and are ready to work for it.

### *How to Read Canada's National Report*

There are three main sections to this report. Section One is a review of Canada's economy, people, and environment, and a look at the linkages between them. It presents a review of Canada's geographic and economic context, including a summary of its economic performance since 1972, as well as a size-up of its population and demographics. Both are illustrated with a few key statistics. Background economic information is useful because it is an indicator of human activity. Because stress on the natural environment is primarily a result of human activity, in particular the way humans make choices, information that sheds light on human behaviour helps us understand more about environmental problems and solutions. Furthermore, our economic performance may also provide some insights into how well we use our environmental resources.

This section also includes a summary of the state of Canada's environment. It reviews key components of Canada's environment, including its air, water and wildlife, as well as its forest, fish, agricultural, energy and mineral resources. The purpose of this part of Section One is to review the elements making up Canada's environment, noting their importance to Canadians both in strict economic and in less tangible terms, and set out the environmental problems and challenges they face.

Section Two highlights some of Canada's efforts to integrate environmental considerations into the Canadian economy and throughout Canadian society. It focuses on the important contributions that key sectors of Canadian society including governments, aboriginal peoples of Canada, business and industry, environmental organizations, labour, development groups, women, youth and individual Canadians have made towards implementing sustainable development. This section is organized on a thematic basis and by sector. Key themes discussed include institutional reform, environmental education and awareness, international efforts, and environmental science and technology.

Section Three provides a vision of the routes Canadians have said that we should take in the future. It not meant to represent a consensus view of Canadians, but rather it is a sampling of existing efforts of Canadians to develop a vision of sustainable development or action plans to implement it. Some are very broad, encompassing the full range of sustainable development issues, while others are focused more narrowly on particular fields of endeavour. Overall, it is intended to demonstrate that at many levels, Canadians are working to define what sustainable development means to them, and how they intend to get there.

This report is by no means comprehensive. So much has been accomplished by so many over the last twenty years that it would be simply impossible to document all the notable actions and achievements. What this report is meant to do, however, is to trace a path through the period, capturing the highlights and noting the major changes that have occurred. More complete information can be obtained by referring to the extensive list of references at the end of this document.

# SECTION ONE: THE ENVIRONMENT AND DEVELOPMENT IN CANADA

## OVERVIEW

Canada is a vast country, covering almost 10 million square kilometres of forests, farms, lakes, tundra and cities and towns. Its 26.5 million people are distributed across a land that rests on three oceans, has the world's longest coastline, and contains seven percent of the world's landmass. Its climates range from the world's snowiest city of more than half a million people (Winnipeg, Manitoba), to the mild, coastal temperate climate of Victoria and the Gulf Islands of British Columbia.

Canada is also a wealthy country. The people of Canada enjoy one of the world's highest standards of living and quality of life. And as a diverse people, Canadians come from a wide variety of ethnic, linguistic and cultural backgrounds.

Much of Canada's wealth and material well-being is based on its rich endowment of natural resources. The underpinning of our economy has always been our environmental resources: from the aboriginal peoples' reliance on nature for everything they needed, through the explorers' quest for gold and furs, to the modern economy as we know it today. Canada's resources include about 9 percent of the planet's supply of freshwater, 10 percent of its forests, and significant reserves of oil, gas, coal and minerals.

One might be inclined to think that, given Canada's huge size and relatively small population, environmental problems should not be a primary concern of the people of Canada. But Canadians have consistently reported that environmental concerns rank very high on the priority list of concerns facing this country.

For one reason, although our population density is very low relative to the rest of the world (at about 2.7 people per square kilometre), a large majority of Canada's people are concentrated in the south, less than 100 kilometres from the U.S. border. Within that area, population densities are high. As a result, Canada's major cities are faced with many of the same problems as other large cities in more densely-populated countries around the world. Health-related issues such as urban smog, polluted waters and drinking water concerns, coupled with broad environmental issues including global warming and destruction of the ozone layer, are serious issues which are of concern to Canadians.

Another important reason why environmental concerns are so high in Canada relates to how we have used the source of Canada's wealth — its environmental resources. We have used our resources to create a robust economy and a wealthy country, but at the same time, we have tended to abuse the source of our wealth. We have polluted our air with sulphur dioxide and ozone, we have dumped toxic substances into the same bodies of water from which we draw our drinking water, and we have left barren large areas from which we have stripped the trees. We have also ignored the impact that these actions have had on the aboriginal peoples who were using the land and resources to maintain viable and healthy lifestyles. Canadians are aware that this is no way to treat the source of our standard of living, and no condition in which to leave our legacy to future generations of Canadians and citizens of the world.

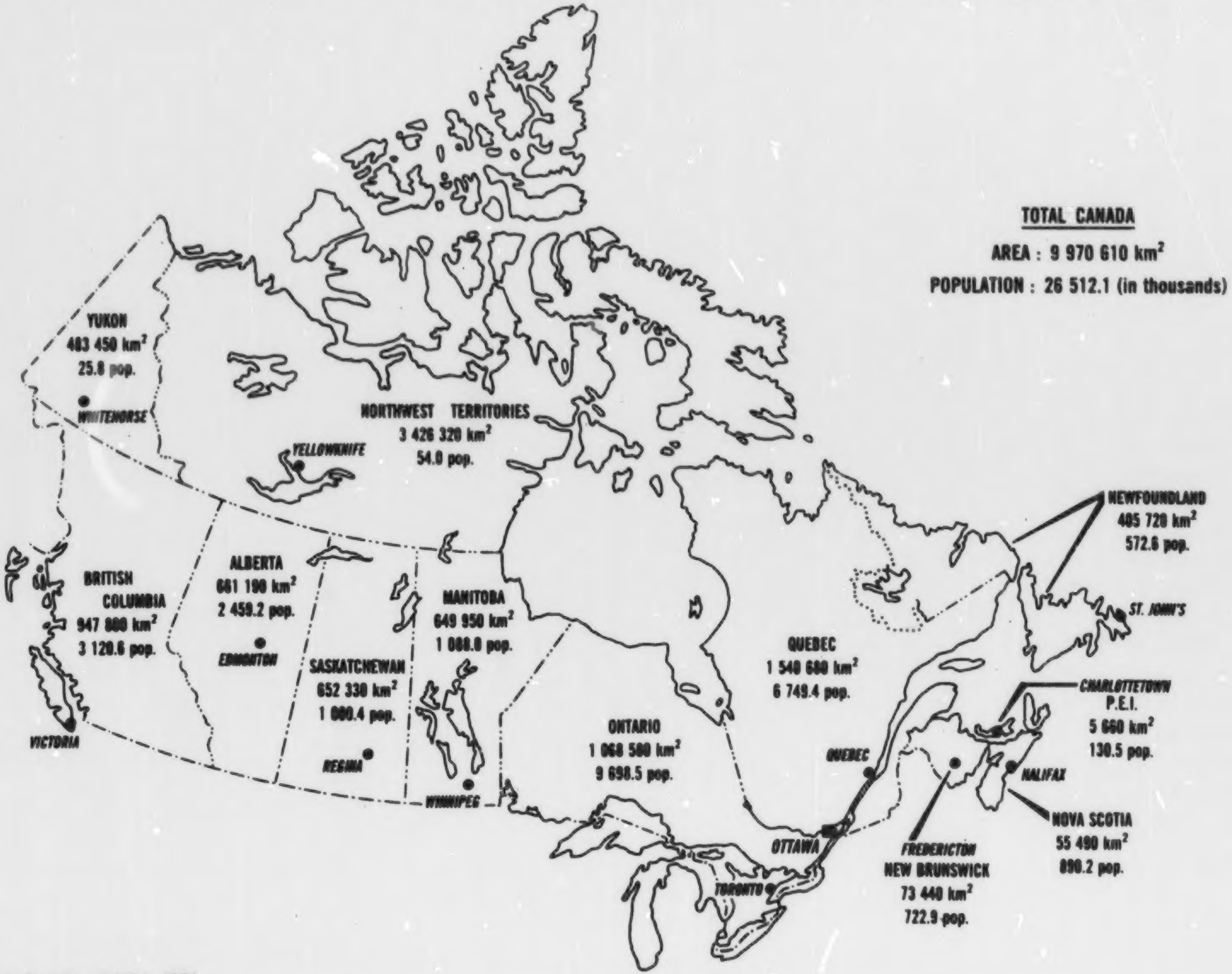
## CANADA'S GEOGRAPHICAL CONTEXT

Canada consists of ten provinces and two territories which together stretch about 7,000 kilometres from east to west encompassing 15 different ecozones and 6 time zones (Figure 1). Quebec is the largest province, with over 1.5 million square kilometres. Prince Edward Island is the smallest, with only 5,660 square kilometres.

Geographically, Canada is dominated by the seven ecozones which make up Canada's north (Figure 2). Yet while these ecozones cover an area of about 5.3 million square kilometres, or about 53 percent of Canada's area, less than half of one percent of Canada's people live there (Table 1). On the other extreme is the mixed wood plain of southern Ontario and Quebec, which makes up less than 2 percent of Canada's area, but is home to 53 percent of the population. In fact the most densely-populated region of Canada is within this ecozone. This region, known in Canada as the Quebec City-Windsor Corridor, is a narrow strip of land that runs along the north shores of Lake Erie and Lake Ontario and also comprises the Canadian portion of the land on either side of the St. Lawrence River, is home to over 50 percent of Canada's people.

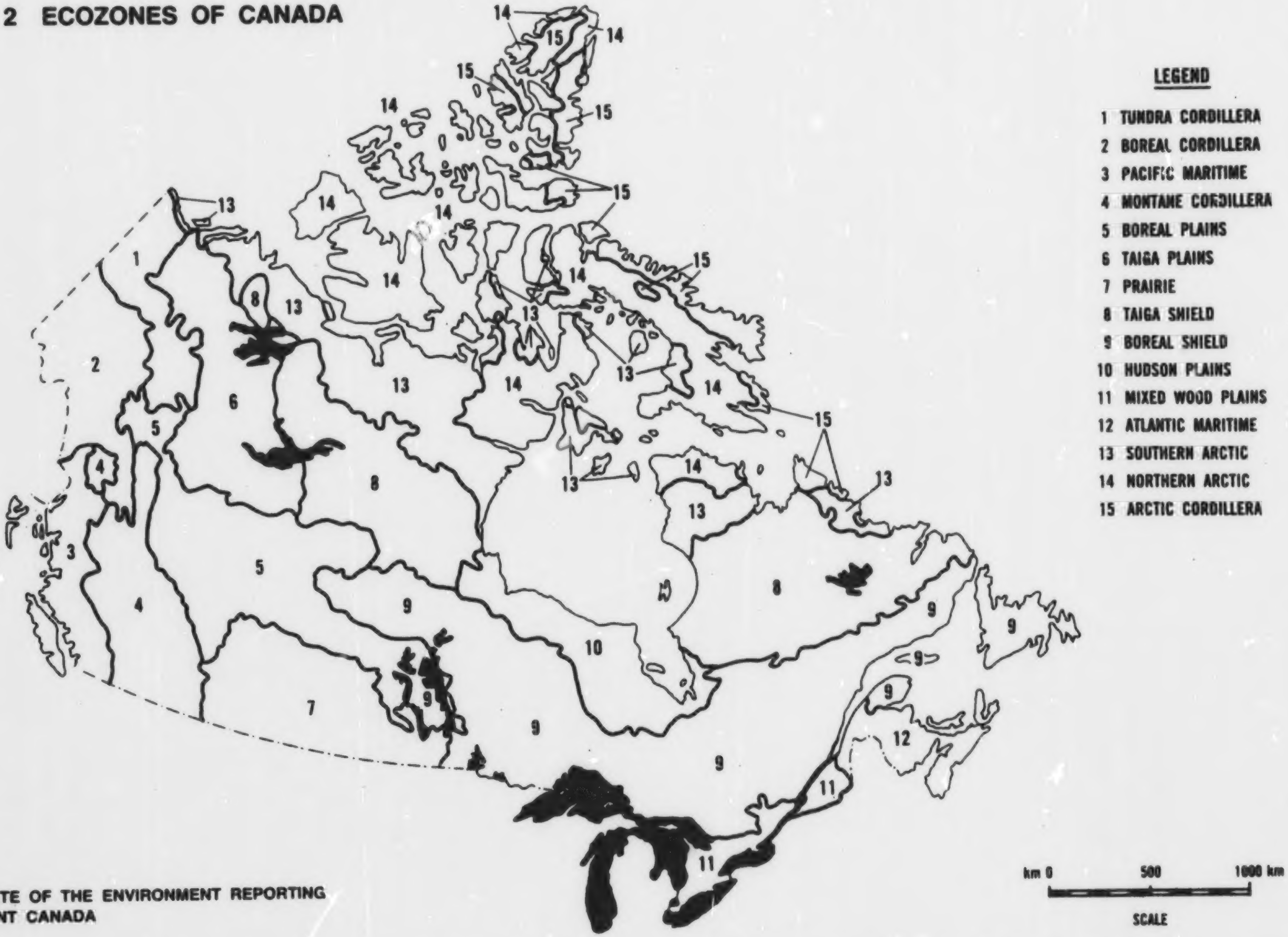
The primarily forested boreal regions stretch across Canada from Newfoundland in the east to British Columbia in the west. Home to many of Canada's extractive industries, the boreal regions make up about 29 percent of Canada's area, and about 13 percent of Canada's people call this broad region home.

## FIGURE 1 CANADA - POLITICAL BOUNDARIES, CAPITALS, AREA AND POPULATION



Source : Statistics Canada, April 1, 1991

FIGURE 2 ECOZONES OF CANADA



E.I.S.D. / STATE OF THE ENVIRONMENT REPORTING
ENVIRONMENT CANADA
April 1991

## TABLE 1
## CHARACTERISTICS OF TERRESTRIAL ECOZONES OF CANADA

| ECOZONE | TOTAL AREA[1] Thousands of ($Km^2$) | POPULATION (Thousands of persons, 1986) | PHYSIOGRAPHY & VEGETATION | CLIMATE | ECONOMIC USE |
|---|---|---|---|---|---|
| TUNDRA CORDILLERA | 282.3 | 0.5 | Mountainous highlands<br>Alpine and arctic tundra | Cold, semi-arid, subarctic | Trapping, hunting, recreation, tourism, mining |
| BOREAL CORDILLERA | 380.1 | 241.4 | Mountainous highlands; some hills and plains<br>Boreal; some alpine tundra and open woodland | Moderately cold, moist montane | Hunting, trapping, forestry, recreation, mining |
| PACIFIC MARITIME | 282.6 | 2165.3 | Mountainous highlands; some coastal plains<br>Coastal, western and mountain hemlock | Very wet, mild, temperate maritime | Forestry, fishing, urbanization, agriculture |
| MONTANE CORDILLERA | 433.2 | 694.9 | Mountainous highlands and interior plains<br>Mixed vegetation; conifer stands to sage brush fields | Moderately cold, moist montane to arid | Forestry, agriculture, tourism, recreation |
| BOREAL PLAIN | 820.8 | 529.8 | Plains; some foothills<br>Conifer and broadleaf boreal stands | Moderately cold, moist boreal | Forestry, agriculture, recreation, trapping |
| TAIGA PLAIN | 584.2 | 19.2 | Plains; some foothills<br>Open woodland; shrub lands and wetlands | Cold, semi-arid, subarctic to moist boreal | Hunting, trapping, recreation |
| PRAIRIE | 521.9 | 3828.5 | Plains; some foothills<br>Short and mixed grasslands; aspen parkland | Cool, semi-arid | Agriculture, urbanization, recreation |
| TAIGA SHIELD | 1385.0 | 51.2 | Plains; some interior hills<br>Open woodlands; some arctic tundra and lichen heath | Moist, cold boreal to cold, semi-arid, subarctic | Hunting, trapping, recreation |
| BOREAL SHIELD | 1718.3 | 2642.8 | Plains; some interior hills<br>Conifer and broadleaf boreal stands | Cold, moist boreal | Forestry, mining, recreation, tourism |
| HUDSON BAY PLAIN | 392.1 | 7.2 | Plains<br>Wetlands, arctic tundra and some conifer stands | Cold, semi-arid subarctic to cold boreal | Hunting, trapping, recreation |
| MIXED-WOOD PLAIN | 151.8 | 13347.5 | Plains; some interior hills<br>Mixed broadleaf and conifer stands | Cool to mild boreal | Agriculture, urbanization, recreation |
| ATLANTIC MARITIME | 163.4 | 1971.7 | Hills and coastal plains<br>Mixed broadleaf and conifer stands | Cool, wet temperate maritime | Forestry, agriculture, fishing, tourism |
| SOUTHERN ARCTIC | 928.5 | 13.1 | Plains; some interior hills<br>Shrub/herb/heath arctic tundra | Cold, dry arctic | Hunting, trapping, recreation, mining |
| NORTHERN ARCTIC | 1426.7 | 11.8 | Plains and hills<br>Herb-lichen arctic tundra | Very cold, dry arctic | Hunting, trapping, recreation, mining |
| ARCTIC CORDILLERA | 260.3 | 1.7 | Mountainous highlands<br>Non-vegetated, some shrub/herb arctic tundra | Extremely cold, dry arctic | Hunting |

[1] These figures include the area of all freshwater in the ecozones, except for the following lakes: Smallwood Reservoir, Lake Athabasca, Reindeer Lake, Lake Winnipeg, Lake Manitoba, Great Slave Lake, Great Bear Lake, Lake Winnepegosis, and Cedar Lake.

Sources: Statistics Canada, Human Activity and the Environment: A Statistical Compendium. March 1986.

Statistics Canada, Environment and Wealth Accounts Division, Environment Information System, 1991.

Environment Canada, State of the Environment Report for Canada. May, 1986

Canada's prairie regions, with about 5 percent of Canada's area and about 15 percent of its people, is dominated by agricultural activities and by several large cities, including Winnipeg, Calgary, and Edmonton. The Atlantic maritime region, one of the first areas settled by Europeans, represents about 2 percent of Canada's area and is home to about 8 percent of its people. The Pacific maritime and montane cordillera ecozones, which make up the bulk of British Columbia, represent about 7 percent of Canada's area and contain about 11 percent of the population.

Canada has a wide range of climates, but on the whole, our climate is generally quite cold. In Alert in the high Arctic, the climate is extremely cold and dry, with temperatures so low that on average there are only four frost-free days per year. Temperatures routinely drop to -40°C and precipitation is minimal, averaging less than 16 centimetres per year. By contrast, the climate of Victoria, on the Pacific coast, is very mild, averaging over 200 frost-free days with about 90 centimetres of precipitation.

Canada's resource wealth is substantial. Its proven oil reserves total about 9 billion barrels, and its natural gas reserves amount to more than 95 trillion cubic feet — good for about 30 years at current production rates. Coal reserves amount to 6.6 billion tonnes, enough to last more than 100 years at current production rates. Productive forest land, totalling about 2.4 million square kilometres, represents approximately 25 percent of the area of Canada. Twenty-one percent of world trade in forest products originates from Canada.

As a major producer of a number of metals and non-metallic minerals. Canada has among the highest reserves of iron ore, nickel, gold, uranium and potash in the world. Over 30 percent of the western world's nickel, 8 percent of its iron ore, and over 20 percent of its zinc are produced in Canada. This country also ranks high in the production of sulphur, potash and asbestos.

Other natural resources are also important. Canada has abundant stocks of fish and wildlife. Millions of songbirds come from as far away as Brazil and Argentina to nest during Canada's short but incredibly productive summers. And Canada is a major repository for a diversity of species representative of northern habitats. Among other things, these resources contribute to Canada's reputation as one of the world's top ten tourist destinations.

Economic activities also vary greatly between ecozones. The north is dominated by hunting, fishing, trapping and subsistence living carried on by aboriginal peoples, along with mining, hydro-electric development and some tourism and recreation activities. The mixed wood plain is dominated by agriculture, urban-based activities, and manufacturing. The boreal regions are characterized by forestry, mining, and tourism and recreation. On the Prairies, agriculture, oil and gas, and urban-based activities are prevalent. The two westernmost ecozones are dominated by forestry, fishing, agriculture, hunting and trapping, urban activities, and tourism. The Atlantic maritime ecozone is host to fishing, forestry, agriculture, and tourism activities.

Two geographic realities have influenced the structure of Canada's economy. The first is that the bulk of Canada's population is located in large urban centres separated by great distances along a narrow strip of land in the southern part of the country. In total, 77 percent of Canada's 26.5 million people live in urban areas, 60 percent concentrated in the 26 largest metropolitan areas. The second is that much of our resource wealth is located north of the main southern-based manufacturing and population centres. The need to move resources to manufacturing centres and markets and distribute finished goods across long distances throughout the country introduces a large transportation and communications component into the output of Canada's economy.

A further consequence is that our energy consumption to "fuel" this transportation requirement is much higher than for smaller, more densely populated countries. In addition, Canada has developed an extensive and advanced transportation and communication infrastructure to support its economy.

Because of the great diversity in climates, landform, vegetation, resources and economic activities, environmental stresses vary considerably across the country. In the boreal zones, some of the main concerns include ensuring sustainable use of forests and non-polluting mining operations. In agricultural and urban-based ecozones, such as the Prairies, the mixed wood plain, and parts of the west coast, concerns include polluted drinking water, urban congestion, loss of wildlife habitat and farmland, and air pollution. On both coasts, declining fish stocks and concerns regarding forestry practices are also significant. In the Arctic, the contamination of wildlife and country food sources by toxic substances is a prime concern.

## DEVELOPMENT TRENDS

Over the past twenty years, Canada has experienced a number of important development trends that offer some insights into the unique challenges we face in dealing with environmental, economic and social issues in Canada.

### General Economic Performance

In general, a country's economic performance is a measure of its ability to create wealth. This is important because the extent to which a society is able to create wealth determines its ability to pursue new social initiatives, including social welfare programs and environmental protection initiatives, while at the same time maintaining existing services.

### *Economic Growth*

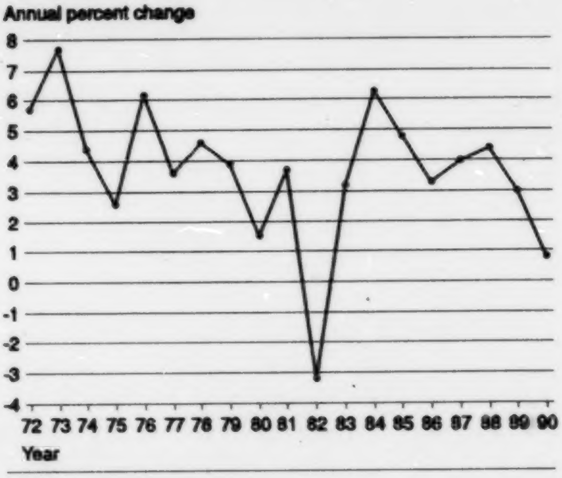
Although growth in gross domestic product (GDP) is generally recognized as an imperfect measure of the true output of the economy because it does not accurately reflect environmental costs, it is nevertheless widely used as a measure of economic performance. In Canada, economic growth over the past two decades has been robust but uneven. While real GDP growth averaged 3.3 percent per year between 1974 and 1990, Canada recorded its largest single drop in economic growth during this period (-3.2 percent in 1982). In 1990, real GDP fell, indicating that Canada had entered an economic recession.

The pace of economic growth has also decreased since the mid-1970s, reflecting the unfavourable effects of world oil price escalations and inflation on the performance of the industrialized world.

### *Inflation and Interest Rates*

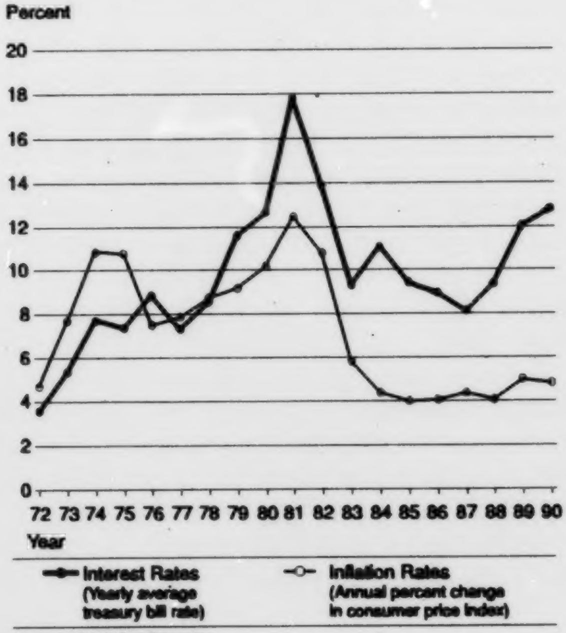
Overall,inflation rates in Canada have declined markedly since the 1970s. The rate of increase in the Consumer Price Index fell from an average of 9.7 percent between 1974 and 1981 to 4.8 percent in 1990. Interest rates, on the other hand, have remained high relative to Canada's major trading partners — in particular the U.S. and Japan — although the differential between U.S. and Canadian rates has been cut in half over the last year. In addition, interest rates in Canada are lower than in many European countries.

**Figure 3.**
**Canada's GDP Performance**



*Source: Statistics Canada.*

**Figure 4.**
**Interest and Inflation Rates**



*Source: Statistics Canada.*

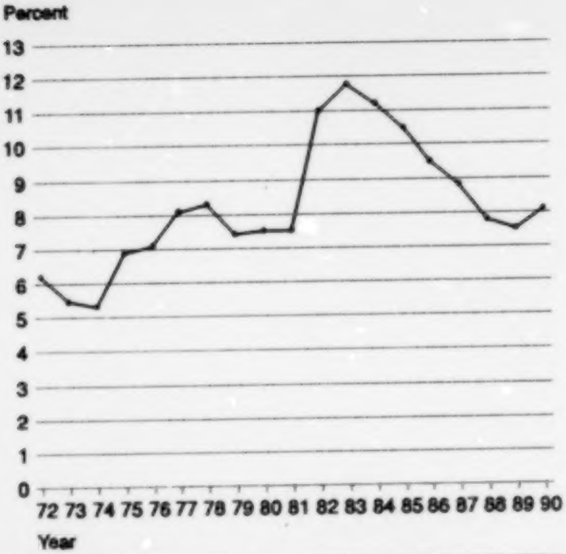
### *Employment, Income and Productivity*

Unemployment rates in Canada have remained relatively high over the past two decades, averaging 8.5 percent between 1974 and 1990, and demonstrated slight increases in the last decade compared to the 1970s. In part, this reflects the increase in participation of women in the labour force.

Average growth in real incomes in Canada has fallen steadily since the early 1970s when annual growth rates averaged 4.3 percent. Growth declined sharply in the first half of the 1980s due to the severity of the 1981-82 recession in Canada. The stronger performance in the second half of the 1980s reflected primarily a rebound from the recession of the 1980s.

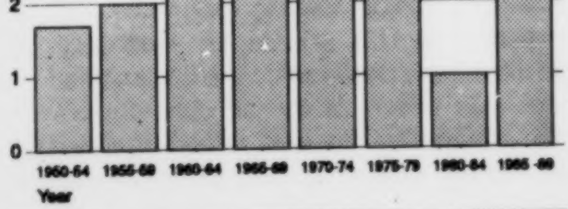
Total factor productivity growth measures both the quality of the economy's capital and labour and the efficiency of their use. It is the broadest existing measure of an economy's productivity performance, capturing the effects of the skill level of the labour force, capability to invent and adopt new technologies, quality of both the workplace and the stock of capital, effectiveness of labour-management practices, and size and scale of production facilities. Canada's average annual productivity growth decreased from about 1.7 percent in the period 1975-79 to zero during the 1980s. Canada's productivity growth is now the weakest among the seven major industrialized economies, the G-7.

**Figure 5.**
**Unemployment Rates in Canada**



*Source: Statistics Canada.*

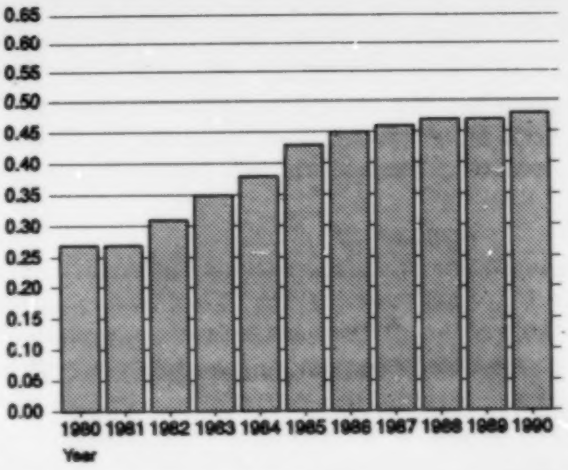
**Figure 6.**
**Real Net National Income per Capita – Five Year Averages of Annual Growth Rates**



*Source: Department of Finance.*

The potential for gains in economic living standards, as measured by real income per capita, depends on how quickly total productivity grows.

**Figure 7.**
**Federal Debt to GNP Ratio**



*Source: Bank of Canada Review, April 1991.*

*Debt*

Despite restraint in the growth of expenditures (including expenditures on infrastructure) and increases in revenues from both direct and indirect taxation, government expenditure requirements have outpaced the ability of most governments in Canada to generate income. At the federal level, this has resulted in over two decades of budgetary deficits and a large accumulation of national debt. In just ten years, between 1980 and 1990, with continuing revenue shortfalls and growing debt interest payments, the federal debt increased from $81.9 billion to $316.6 billion, reaching almost 50 percent of national income as measured by gross national product (GNP).

With the exception of a few years, the aggregate expenditures of provincial and municipal governments in Canada have also exceeded budgetary revenues over the past two decades.

The implications of increased debt are two-fold. First, there is a substantial backlog of demands for infrastructure. Second, large portions of government revenues are needed to service debt, reducing the resources available for new initiatives. Federal public debt charges in the fiscal year 1990/91 alone were 28 percent of total budgetary expenditures.

## Sectoral Economic Performance

A review of the performance of Canada's economy on a sectoral basis is important for several reasons. For one, it provides an indication of where environmental stresses are likely to come from in the future. For example, in industries that are shrinking, growth in resource use is not important, but abandonment of facilities may present problems. Sectoral performance also indicates which sectors will have the greatest difficulty in meeting higher environmental standards in the short-term. For example, if an industry has been unprofitable for a period, it would have difficulty undertaking expensive new environmental programs.

During the last two decades, there has been substantial variation in economic performance among sectors. For instance, forestry has seen strong and steady overall growth, while mining has actually declined over the last 20 years. Still others, such as agriculture, have not experienced much growth at all. Accordingly, the ability of various sectors of the economy to respond to environmental issues has varied.

### *Agriculture*

On the whole, the size of Canadian agricultural output changed only slightly during most of the 1970s and 1980s, despite steady annual real growth in the demand generated by key food processors (one percent or more annually), and generally strong growth of wheat exports, the largest single export influence on the sector. Recent recovery from the droughts at the close of the 1980s suggests that agricultural output will increase gradually. The immediate problem facing agriculture is prices. For 1990, total sector selling prices were approximately 7 percent below those of 1981. Real agricultural selling prices have been reduced to about 45 percent of their levels a decade earlier, presenting serious economic problems in the sector.

### *Fisheries*

Following the benefits gained for domestic producers from extension of territorial rights, real growth of the fisheries and fish processing decreased, but was not eliminated through the first two-thirds of the 1980s. More recently, however, quota reductions on the east coast, reflecting decreased stocks of northern cod and other species, have had a severe impact on the sector: reduced sizes of the catch, and the closing of fish processing facilities throughout the Atlantic provinces. However, selling prices remain strong.

### *Forestry*

In general, real output in forestry and related manufactures (sawmills and planing, veneer and plywood, and the pulp and paper industries) has experienced strong growth over the past thirty years. Although increased costs of production resulting from the Softwood Lumber Agreement with the United States could slow down growth of the sawmill and planing sectors for some prolonged period, continued growth appears likely. Pulp and paper companies are currently suffering from overcapacity and a drop in prices, but overall, selling prices in this sector have also held up reasonably well in the 1980s and in 1990.

### *Mining and Oil and Gas Production*

The most significant exception to the steady growth in some sectors is the decrease in the mining sector. Within this sector, the major long-term weakness has been the upstream oil and gas sector, and iron ore production. In 1971, (at 1981 prices) real GDP reported for the oil and gas sector was $20 billion; by 1981, this had been cut in half to less than $10 billion. While there has been some recovery since, output continues well below levels that prevailed twenty years ago. 1990 real prices for oil and gas combined are now about 50 percent of their 1981 level.

For iron ore, real output in 1990 was approximately one-half that of its 1971 level in which output peaked due to the Vietnam War and the generally strong growth in the industrial countries. Domestic steel production remained stagnant through most of the second half of the 1970s and into the 1980s, and has recently declined noticeably because of the current North American economic recession. Further, prices for both iron ore and steel manufactures have been soft in recent years.

Production of copper, nickel, zinc and precious metals peaked in 1974. Real activity has subsequently declined (about 20 percent) and is now at about the same level as that which prevailed in the early 1960s. Generally, selling prices have held up through the 1980s.

### *Manufacturing*

Among manufacturing industries, the record for real growth is generally positive, with some exceptions. These include processing of meat and poultry products, which produced about 9 percent less in 1990 than in 1981. This aspect of food processing, along with production of dairy products, is likely to continue under stress following both the liberalization of trade with the United States and the more general reductions of processed food tariffs under GATT. Producers of alcoholic beverages, particularly wineries, reported real GDP in 1990 as 22 percent below that of 1981. Production of tobacco products has also been notably reduced (41 percent), at least partially reflecting the success of health campaigns.

Among manufacturers of durable goods, production of agricultural machinery, railroad rolling stock and shipbuilding (despite significant additions to demand for military frigates) have all experienced reductions of 35 percent or more over the course of the 1980s.

## Regional Performance

Canada is made up of regions which have significantly different economies. The economic performance of each region is important to the environment for the same reasons that sectoral performance is important; i.e, it provides an indication of both where the stresses are, and what sectors will be most sensitive to higher environmental standards in the short-term.

The economy of Atlantic Canada is dominated by production that depends on exploitation of the land and sea. The export base of the Prairie provinces is predominately agriculture and oil and gas production. British Columbia's economy is particularly dependent on the forest and fisheries sectors. Manufacturing is the major form of goods-producing economic activity in the central provinces of Ontario and Quebec. But while other producers of goods are proportionately less important to the central region's economy, this same region accounts for the largest national output from agriculture and food processing, forestry and related manufactures, metal mining and primary metal manufactures, non-metallic mining and manufacture, and chemicals.

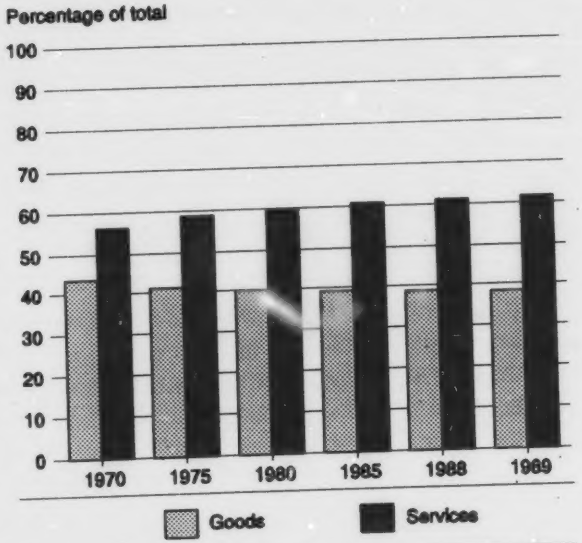
Like sectoral performance, economic performance has varied between provinces. British Columbia and Ontario have enjoyed the highest economic growth between 1985 and 1990, averaging 4.2 and 4.0 percent per year, respectively. Quebec, New Brunswick and P.E.I. have performed better than average, and Manitoba, Saskatchewan and Nova Scotia have seen less than average economic growth. Newfoundland and Alberta have experienced the lowest growth rates over the same period, at 2.2 and 2.4 percent, respectively.

## Canada's Economic Structure

It is important to consider Canada's economic structure when reviewing how the economy will affect the environment, because as the economy changes, its demands on the environment change. In general, the service sector puts less stress on the local environment than the goods producing sector.

Over the past several decades, the output of Canada's economy has become

**Figure 8.**
**Gross Domestic Product by Sector**



Note: Includes both the business and non-business sector.

*Source: Statistics Canada.*

increasingly dominated by the production of "services". The service sectors include transportation and communications; finance, insurance and real estate; government services; wholesale and retail trade; and community, business and personal services. In 1963, these services represented about 53.7 percent of the total output of the economy. By 1989, this share had grown to 61.3 percent. In terms of employment, the service sectors now provide almost 79 percent of all jobs.

In contrast, the production of goods, including the output of the resource-based industries, has shrunk from 46.3 percent to 38.7 percent over the same period. But despite the shrinking contribution of this sector, the goods-producing industries are still extremely important to the Canadian economy and are likely to remain so in the foreseeable future. They produce the bulk of our exports, and to a great extent, the large services sector exists to support them. Any downturn in the goods-producing sectors is reflected in the performance of the economy as a whole.

### The Role of Trade

Canada's economic development and its ability to create wealth is becoming increasingly dependant on trade. This is in line with the worldwide trend to the globalization of the world's economy, where goods and services are produced in countries which have a comparative advantage, and traded with other countries. Canada is currently the eighth largest trading nation in the world. Our economy has become progressively more export-oriented over the past three decades with growth in exports outpacing economic growth. As a result, exports have increased from 15 percent of output in 1960 to about 30 percent today.

Over the years, Canadian trade has shifted away from Europe, particularly Britain, toward the United States and Japan. Today, the United States is our most important trading partner, accounting for about three-quarters of Canada's exports and approximately two-thirds of our imports. In part, increased trade with the United States reflects the geographic structure of Canada, where large U.S markets are frequently much closer to Canadian production centres than are other Canadian markets. As a result, market-based economic incentives are increasingly influencing trade in a north-south direction rather than an east-west direction.

The composition of Canadian exports has shifted strongly toward manufactured products, increasing from under 10 percent of exports in 1960 to over 40 percent in 1990. However, Canada still relies heavily on exports of natural resources. Canada has the largest share of unprocessed goods in total exports among the G-7. Future opportunities for Canada include increasing the level of value-added processing to its exports.

Energy has played a particularly important role in Canada's international trade. The share of energy exports to total Canadian exports increased from 6 percent in 1970 to 10 percent in 1986 with crude oil and natural gas accounting for the bulk of exports. Canada is also a large exporter of coal and remains a leading producer and exporter of uranium.

Canada leads the world in value of mineral exports and ranks fourth among the diversified mineral producers in non-fuel mineral production behind the Soviet Union, the United States and South Africa.

Renewable resource exports are important to both the Canadian economy and the global economy. In 1986, Canada was the world's largest exporter of fishery products; in 1989, it accounted for 21 percent of the value of world trade in forest products. In 1986, Canada accounted for roughly 26 percent of total world wheat exports.

## WEALTH DISTRIBUTION

Wealth and income are important indicators of economic status which, in turn, provides a meaningful basis for assessing the economic welfare of Canadian residents. In addition to absolute levels of wealth and income, distributions of wealth and income among different groups of individuals and regions are also significant, particularly from a social equity point of view. This section provides a brief review of trends in the distribution of wealth and income in Canada.

### Distribution of Wealth Among Canadian Households

Compared to income, wealth or net worth, as it is sometimes called, offers a more precise measure of an individual's economic status. This is because unlike income, which provides only a "snap-shot" view of one's economic well-being, wealth takes into account past accumulations of both income and debt and thus offers a better reflection of an individual's command over his or her time and resources. Table 2 presents the results of three wealth surveys conducted of Canadian households for the years 1970, 1977 and 1984. The results of these surveys generally indicate that while the average level of household wealth in Canada rose quite markedly over this fourteen-year period, fuelled in part by the increased participation of women in the labour force, the distribution of wealth among households has changed only slightly.

### Table 2
### Distribution of Wealth by Income Group, Canada, 1970, 1977 and 1984

| Income Quintile | 1970 | 1977 | 1984 |
|---|---|---|---|
| | (percent shares) | | |
| 1 | 10.4 | 9.0 | 6.1 |
| 2 | 13.8 | 12.8 | 12.4 |
| 3 | 14.0 | 15.0 | 16.4 |
| 4 | 19.0 | 19.0 | 20.3 |
| 5 | 42.8 | 44.3 | 44.8 |
| Average Wealth per Household | $44.4 | $68.2 | $85.3 |
| (000 1984 $) | | | |

Source: Statistics Canada Catalogue 13-588.

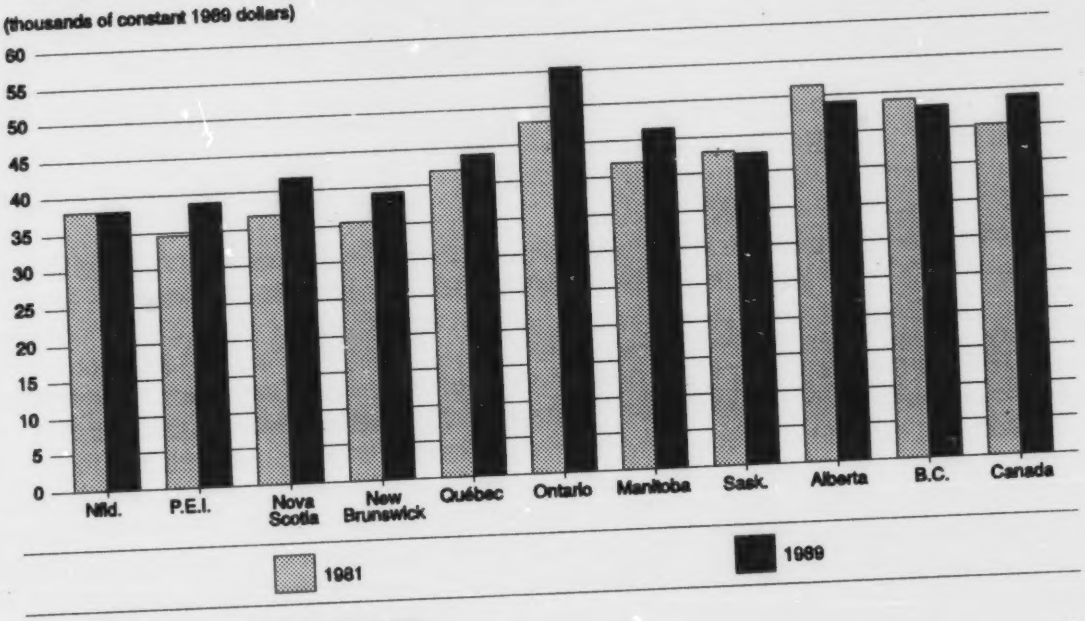
Table 2 suggests that the distribution of wealth among Canadians is somewhat concentrated when it is viewed in terms of household income. Between 1970 and 1984, more than 40 percent of personal wealth was concentrated in households belonging to the top income quintile, while approximately 65 percent of wealth belonged to households falling into the top two income groupings. On the other end of the income scale, households in the first income quintile accounted for less than 11 percent of total wealth in 1970 and by 1984 this share had declined to just over 6 percent.

A review of wealth distribution on the basis of age reveals some interesting results. Households headed by persons aged 45 to 65, in general, possess a good deal more wealth than the average Canadian household; those headed by people aged less than 45 tend to possess less wealth than the Canadian average. Those headed by people older than 65 possess more than the Canadian average, although by less than the middle-aged group. However, among people aged 65 and over, there is evidence that income and earnings of women are just over half that of men.

## Income Distribution Across Regions

On a regional basis the allocation of average family income is uneven. In constant dollar terms, average family incomes in the Atlantic provinces have been and continue to be the lowest in Canada. Though the gap between the income of the average Canadian family and that of households in Nova Scotia narrowed over the 1981 to 1989 period, for the other Atlantic provinces this gap remained relatively constant or has increased.

**Figure 9.**
**Average Household Income, 1981 and 1989**



*Source: Statistics Canada and Canada Year Book, 1989.*

In the early 1980s, households in Alberta enjoyed the highest average family income compared to all other Canadian provinces, followed by households in British Columbia and Ontario. By 1989, however, the average income of Ontario families was the highest compared to all other Canadian provinces, while that of families in Alberta and British Columbia only matched or actually fell below that of the average Canadian household. During the period 1981 to 1989, the average income of all Canadian households increased in real terms by approximately 8.5 percent or by slightly more than 1 percent per annum. Incomes of Ontario families grew the most over this period, by almost 15 percent, while those of families in Saskatchewan, Alberta and British Columbia declined in real terms.

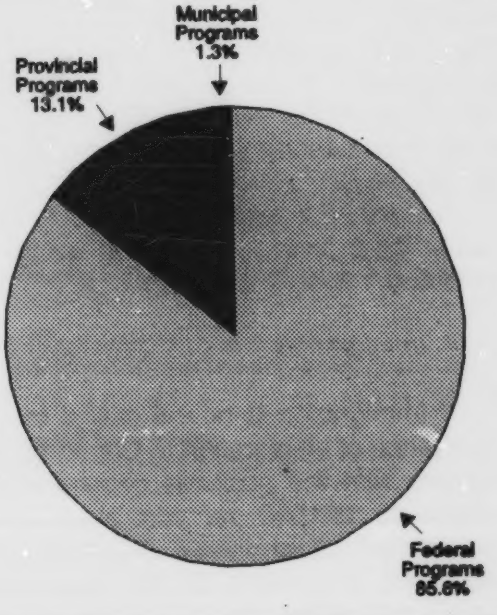
## Corporate Income And Profitability

Private industry accounts for a very significant share of total national income. At the total industry level, profits and other investment income grew at an average annual rate of approximately 7.5 percent over the 1980-1989 period, although the recent recession has reduced profitability. Recognizing that industry profitability is often quite variable and fluctuates from year to year, particularly in the resource-based sectors, those industries enjoying the largest average annual increase in profits over this period were the fishing, communications and finance, insurance and real estate sectors. Conversely, profits and investment income in the mining, oil and gas, and storage sectors actually declined over the past decade.

## Income Security In Canada

All three levels of government in Canada provide a broad range of social security programs, designed to ensure that Canadian residents have the resources required to meet their basic needs. Of the total $54 billion spent on social security in 1987, federal programs accounted for the major share (over 85 percent). Programs catering to the needs of specific groups make up the bulk of federal expenditures, in particular those falling under the Canada Assistance Plan, the Canada and Quebec Pension Plans, Old Age Security and Unemployment Insurance. Provincial social assistance, on the other hand, is largely geared towards fulfilling the income needs of a broad base of persons requiring basic income support.

**Figure 10.**
**Social Security Expenditures, 1987**



*Source: Canada Yearbook, 1990.*

Government programs represent about 11 percent of income earned by all families and other individuals in Canada, but in the lower income groups this share is considerably higher. For families and persons with incomes of less than $10,000, transfer payments comprise almost 70 percent of total income. This share declines rather sharply as one moves into higher income groups, as families with incomes in excess of $40,000 receive less than 5 percent of their income from such sources.

## POPULATION AND DEMOGRAPHICS

Trends in Canada's population will have an impact on both Canada's economy and its environment. Labour force growth and other demographic fundamentals affect the prospects for long-term economic performance. With respect to the environment, it is the interaction between people and the environment that has led to environmental problems, and more people naturally means more interaction with the environment. While this by itself does not necessarily imply further environmental degradation, it does imply added stress, especially in densely populated areas.

### Population

*Growth and Fertility*

In 1990, Canada's population numbered 26.5 million. Annual growth of the population, which averaged 2.8 percent in the years following World War II, has decelerated steadily since 1957. Canada's population is currently increasing by an average of 1.1 to 1.3 percent per year. This deceleration in the growth rate is based on a dramatic decline in the fertility rate, as measured by the number of children per woman in her child-bearing years. From a high of 3.9 in the mid-to-late 1950s, the fertility rate has decreased to about 1.7 to 1.8. Although life expectancy has risen steadily in Canada (to 80 years for females and 73 for males), it has only provided a small offset in population growth to the falling fertility rates, and the fertility rate is now below the estimated "replacement" level of 2.1.

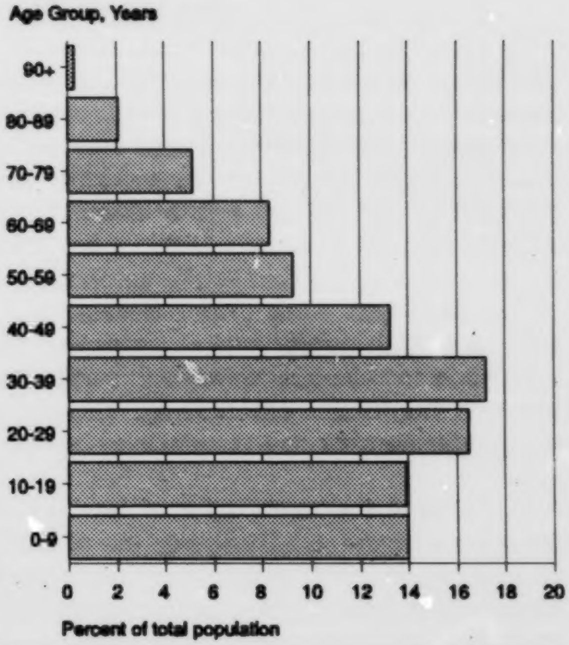
*Immigration*

Immigration is now a critical factor in the growth of Canada's population. The importance of immigration to Canada is not new. Although the annual immigration rates fluctuate with the business cycle and with external events, the totals have averaged 140,000 to 150,000 per year since World War II. The Government of Canada has committed itself to annual immigration of 250,000 to be reached in the early 1990s. Combined with falling fertility rates, this implies a much more significant role for immigration in the growth of Canada's population. In 1990, for example, gross in-migration of 208,400 was equivalent to 57 percent of the change in the population for that year; even allowing for out-migration, net immigration in 1990 (162,500) was equivalent to 44 percent of the population change.

Immigration currently originates principally from areas that lie outside "traditional" European sources. In 1987, for example, approximately 45 percent of immigrants came from Asia; less than 40 percent were from Europe and other regions of North America. The origins of the balance (15 percent) were divided about evenly between South America and Africa. Given current government policy on immigration, which emphasizes family reunification, refugee and other non-economic determinants for immigration, Canada expects non-economic classes of immigrants to reach approximately 150,000 per year. This strongly suggests that the shift towards non-traditional sources of immigration will continue into the future.

### *Population Profile*

**Figure 11.**
**Population Distribution by Age Group, 1990**



*Source: Informetrica Ltd.*

A high birthrate in the years following World War II dominated the demographic profile of the 1960s and 1970s as these "baby boomers" passed through their childhood. On the whole, this "bulge" of young people has now passed in Canada, and currently there is a fairly uniform distribution of the population by age group, with a slight tilt towards those who are in the early part of their participation in the labour force. It should be noted, however, that this is a general trend, and there are major exceptions. For instance, in many aboriginal communities, over 50 percent of the population is under 15 years of age.

One interesting feature to note about this structure is that 44 percent of the population, aged 29 or less, has been, or is in the process of being educated at a time when sensitivity to the importance of the environment is heightened in Canada. As a result, it is likely that the overall level of environmental awareness of Canadian society will continue to increase.

Current and past immigration provides Canada with a rich ethnic and linguistic heritage, although the official languages of Canada are English and French, which combined, according to the 1986 Census of the Population, constituted almost 90 percent of the languages spoken in people's homes. Among others, Italian, Chinese and the languages of the aboriginal peoples (reportedly spoken in almost 100,000 homes) were the principal exceptions.

Apart from those whose origins are either English, French or aboriginal (estimated at about 1 million people), notably large ethnic groups (those numbering 300,000 or more) were the Dutch, German, Ukrainian, Italian, and Chinese. These ethnic groups are large components of Canada's urban centres. Thus, immigrants constituted the following population shares of Canada's three largest cities: Toronto (41 percent), Vancouver (39 percent) and Montreal (21 percent).

## Demographics And Growth Of The Labour Force

The participation of the age eligible population in the labour force is 67 percent. This includes participation rates of more than 90 percent for males in the "prime" productive years (25-54), and more than 75 percent for females. A notable trend of the past thirty years has been the reduction in participation rates of those over 54. This reflects the considerable success the country has enjoyed in developing both social and privately sponsored insurance and other savings systems. The other notable trend is in participation of women in the labour force. For women aged between 15 and 54, participation rates are now within a few percentage points of the male rates.

Enrolment rates in universities suggest considerable progress in ensuring that access to high quality jobs is gender neutral. Nonetheless, women in post-secondary education remain concentrated in traditionally female fields of study such as education, fine arts, humanities and nursing. Studies also indicate that wage discrimination based on gender persists.

Overall, the combination of demographic fundamentals and changes in participation rates have fundamentally altered the growth of the Canadian labour force. In the 1970s, and as late as 1981, annual changes in the labour force were in the range of 3 percent. Growth has now decelerated to about 1.4 percent. Equally important has been the change in the structure of the labour force, and a reduction in the number of young workers. From 1981 to 1990, the labour force between the ages of 15 and 24 had shrunk by 13 percent. Thus, where past labour force trends tended to favour adoption of labour intensive solutions, trends are now beginning to favour capital-intensive production. Further, for producers in the primary sectors, and in many other goods-producing industries, the reduced supply of young workers may be a significant constraint.

## THE STATE OF CANADA'S ENVIRONMENTAL RESOURCES

### Forests

Canada is a forest nation, ranking third in the world in terms of forested land, after the USSR and Brazil. About 45 percent of the country, or 453 million hectares, is covered with trees. This represents 10 percent of the world's resource. Productive forest land is estimated at 244 million hectares. Jurisdiction over the forest resource rests mainly with the provinces in that they are the mandated custodians of approximately 80 percent of Canada's forest land. Eleven percent falls under federal responsibility and nine percent is privately owned.

Temperate forests stretch across the country in a patchwork of primary and second growth stands, in various stages of maturity. The vast Boreal Forest Region is the single most important forest region in the country. It forms a continuous belt from Newfoundland and the Labrador coast, westward to the Rocky Mountains and northwestward to the Yukon and Alaska. Prominent conifers in this area are spruces, tamarack, firs and pines. Some birch and poplar occur in the central and south-central portions. Several coniferous forest regions are found in the west, characterized by Douglas fir, hemlock, western red-cedar and several species of spruce and pine. The mixed forests of eastern Canada consist mainly of pines, hemlock and birch with associated dominant broad-leaved species including maples, oak, basswood and elm. Boreal species such as spruces, pines, balsam fir, poplar and birch are more abundant in the northern part of these mixed-wood forests.

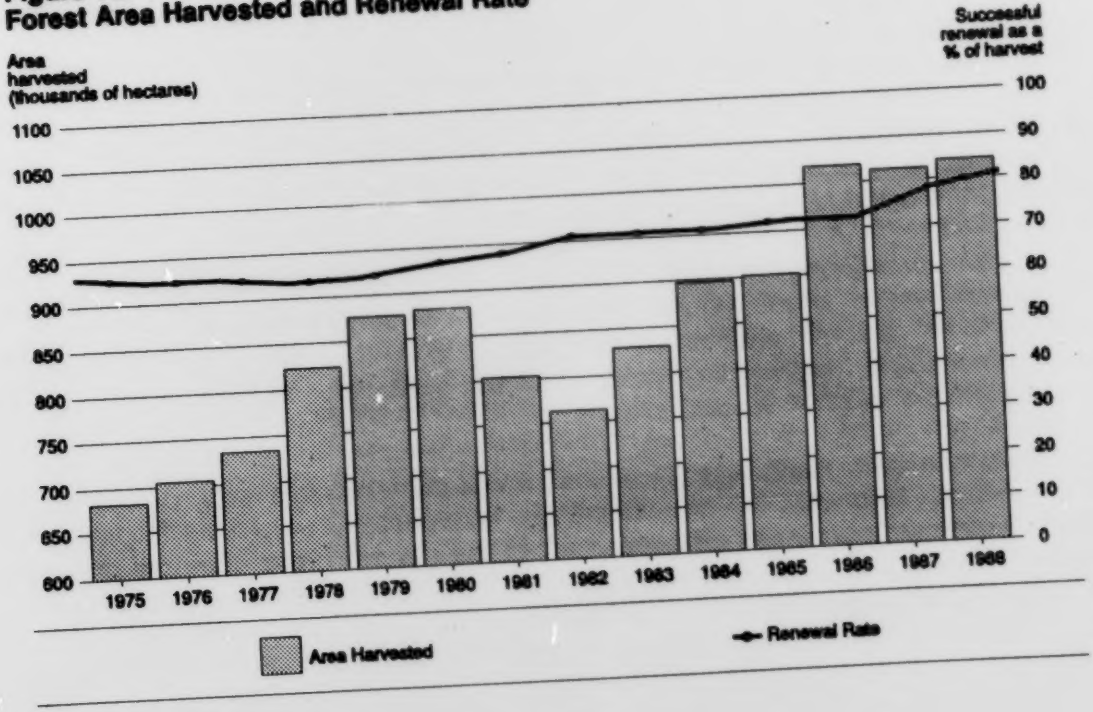
From an environmental perspective, Canadian forests are a vital part of our planet's life support system. As is the case elsewhere, they harbour important gene pools of plants and animals; moderate temperature, rainfall and other climatic conditions; enrich and protect soil fertility; regulate the quantity and quality of water; and provide wildlife habitat. They also serve as carbon sinks.

Economically, the forests of Canada provide the renewable resource base for the largest industry in the country. More than 7,000 enterprises, of which over 75 percent are Canadian-owned, accounted for 3.4 percent of the nation's gross domestic product in 1989. The value of product shipments (primarily pulp, paper and lumber) was $49 billion in 1989, $23 billion of which was exported. This earned Canada the reputation of being the world's largest exporter of wood products. In addition, our forests support a multi-billion dollar tourism and recreation industry.

The social importance of forests to Canadians is unequivocal. Almost 900,000 people, or 1 in 15, rely on forestry for their livelihood and 350 communities across the country are forestry-dependent. Forests also play a vital role in the lives of the aboriginal peoples of Canada and provide many Canadians with important aesthetic and spiritual benefits.

In general, forest management in Canada is increasingly predicated on the principle of sustainable development. The systematic renewal and tending of forests following harvesting is one example of the concerted efforts being made to ensure the availability of this resource for generations to come. Recognizing that Canada's record of reforestation after harvest has not been good, reforestation initiatives have more than quadrupled over the last decade. In 1990, over one billion seedlings were planted in Canada and forest management expenditures totalled over two billion dollars.

**Figure 12.**
**Forest Area Harvested and Renewal Rate**



*Source: Forestry Canada.*

A number of key controversial issues are currently being debated by forest interests. The debate is not always so much a question of choosing between forests for timber versus forests for other uses, but rather, how all of these uses can best be integrated. Wildlife habitat, watershed protection, recreation and aesthetic values are gaining prominence. Thus, how old-growth forests in British Columbia, Ontario and Alberta should be used is a topic of much deliberation, requiring resolution through meaningful consultation and discussion.

In addition, harvesting techniques such as clearcutting are often criticized, as is artificial reforestation using a single species and the use of chemical pesticides to control insects.

The Canadian forest sector faces increasing international competition, a changing resource base and growing public demand for more environmentally friendly forestry practices that are in keeping with natural forest ecosystems. There are strong and compelling reasons for Canada to embrace sound forest management practices for the well-being of Canadians and all inhabitants of the globe. As a result, the traditional approach to forest management in Canada is shifting to forest ecosystem management.

### Fish

Canada's long coastline and abundant freshwater systems have given Canadians access to vast stocks of fish. The search for fish first attracted Europeans to the waters off Newfoundland early in the 16th century. In 1990, commercial production from the Atlantic, Pacific and freshwater fisheries totalled about $3.1 billion. Aquaculture production was worth $145 million. Fish harvesting and processing supports 94,000 commercial fishermen, 37,000 plant workers, and more than 4,500 aquaculturists.

Although the fishing industry represents less than 1 percent of Canada's gross domestic product, commercial fishing is essential to many regional economies. For some 1500 coastal and remote island communities, it represents the only real employment opportunity. For many of Canada's aboriginal people, the fishery is both a prime source of food and livelihood and an important part of their culture. The fishery also provides recreational opportunities to more than five million Canadians and one million foreign visitors annually.

Many species of wildlife depend on healthy stocks of certain fish. For example, the long-term vitality of populations of sea birds such as puffins is dependent on healthy stocks of capelin and other forage fish. A number of marine mammals also rely on healthy fish stocks to survive.

Over the last two decades, fish stocks in Canada have come under pressure from overfishing and habitat destruction. During the 1960s, for example, the commercial groundfish and open sea species catch in Canada's Atlantic waters increased rapidly, primarily because fishing was open to all countries beyond 12 miles offshore. In the early 1970s, stocks started to fall, mainly due to intense harvesting. Commercial fisheries in the Great Lakes declined seriously in some fish stocks due to a combination of factors including competition between new and existing species, changes in habitat, contamination by toxic chemicals, and shoreline development.

In recognition of the limits of the resource to sustain itself, both provincial and federal governments have shifted from open access management regimes to limited-entry management with catch quotas, gear restrictions, trip limits and the like. Governments have also supported stock rebuilding programs and fish habitat restoration. As a result, some stocks are recovering, including some open sea and groundfish species. Some fish stocks have even reached historic highs such as Fraser River sockeye salmon and Lake Erie walleye.

Despite these efforts, overfishing and habitat destruction continue to threaten the sustainability of Canada's fisheries resource. Atlantic groundfish stocks outside and straddling our 200 mile fishing zone have been seriously depleted by fleets from certain European Community nations and other countries. In the Pacific Ocean, foreign driftnet fleets operating beyond the Canadian zone hang thousands of kilometres of fine-meshed nets which indiscriminately trap and kill millions of fish and thousands of seabirds and marine mammals. Fish in our inland waters are threatened by overfishing and by habitat destruction.

Habitat destruction comes from a variety of sources including agriculture, mining, forestry, transportation, energy development, urban growth and industrial activity. For example, close to 50 percent of the shellfish growing areas in Nova Scotia, and some 500 square kilometres of harvesting areas in British Columbia are now closed due to contamination. One in every seven eastern Canadian lakes has been damaged by acid rain.

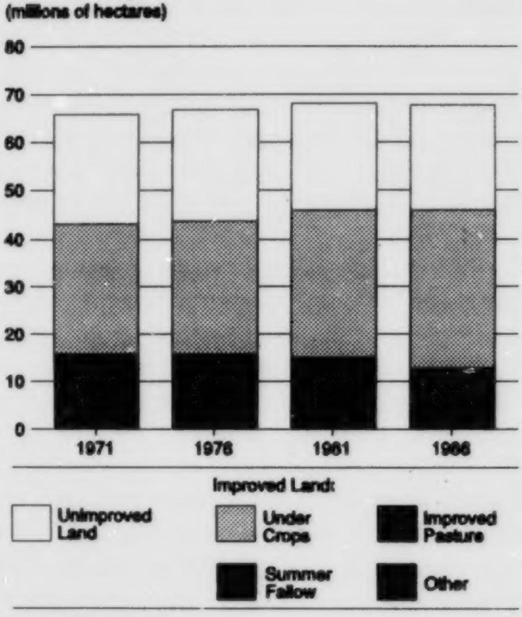
The long-term sustainability of our fisheries depends upon both sound harvesting practices and healthy and productive fish habitat. Harvesting rates must not exceed the capacity of fish stocks to maintain themselves. In fact, Canada's current objective is to set quotas at levels which will increase stocks. Fish populations, however, cannot be maintained if their habitat is endangered. Governments and industry are accelerating efforts in both of these areas. In particular, Canada is pursuing a number of initiatives aimed at eliminating foreign overfishing. Habitat restoration action has also been expanded in recent years. To further these efforts, a priority for 1992 will be the development of a national Sustainable Fisheries and Oceans Policy.

## Agriculture

Agriculture is one of Canada's major resource industries, contributing about 3.6 percent to the country's GDP. The industry comprises some 293,000 farms which provide employment for 450,000 Canadians in primary agricultural production, plus an additional 1.5 million Canadians in related farm supply, processing, distribution and retail businesses. Sales of primary agricultural products alone amount to $22 billion annually.

Canadian agriculture is regionally diverse, reflecting the great differences in soils, topography and climates across the country. In the vast grain-growing Prairies of western Canada, representing 80 percent of Canada's farmland, the combination of low and variable rainfall and a relatively hot, short growing season dictates a comparatively low input, non-intensive type of production. In the smaller farmland areas of eastern Canada, more humid conditions allow for more intensive production.

**Figure 13.**
**Use of Farmland**

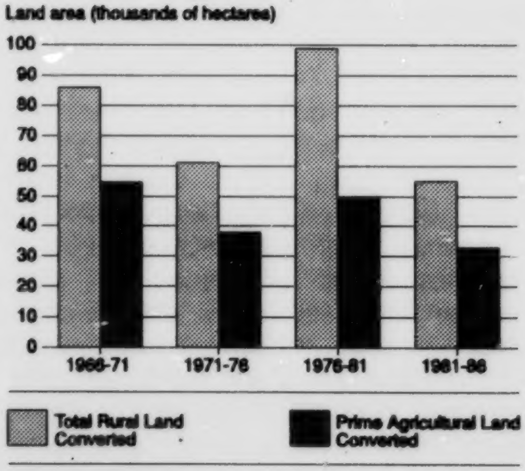


*Source: Statistics Canada.*

Of Canada's total land area, farmland represents only 7 percent. Less than 5 percent of this is improved, and less than one percent is considered "prime" agriculture land. Since 1971, total farmland area in Canada has increased only slightly, with the amount of improved farmland also increasing slightly.

A high proportion of Canada's best agricultural land is located within a short distance of the country's major urban centres, and is therefore under pressure from urbanization. Overall, the conversion of farmland to urban uses does not pose an immediate threat to Canada's ability to produce an exportable surplus of high-quality agricultural produce. However, there are grounds for concern over the longer-term

**Figure 14.**
**Rural to Urban Land Conversion**



*Source: Warren et al. 1989, taken from Environment Canada, SOE Report 91-1.*

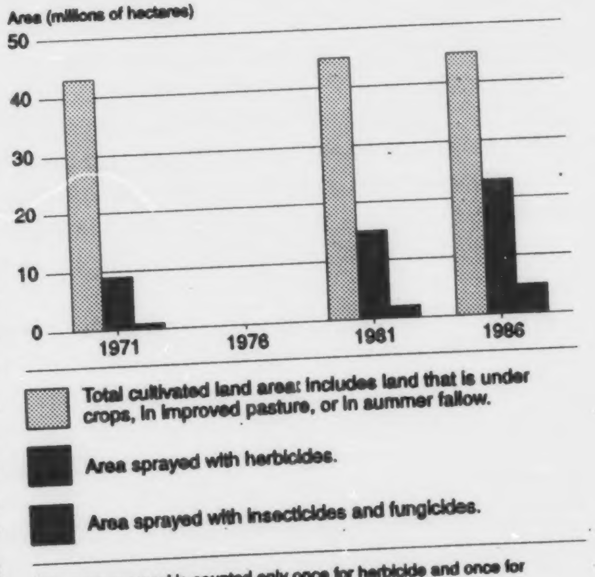
implications of these conversions, because they disproportionately affect the best classes of agricultural land, and because there are only limited areas suitable for agriculture that have yet to be developed.

In all agricultural areas of Canada, a major concern has been soil loss. Wind and water erosion of soils is brought about by a combination of factors including the cultivation of marginal farmlands and farming practices such as excessive tillage, monoculture, and summer-fallowing. Salinization is also associated with summer-fallowing, as well as long-term irrigation using high mineral content water.

The economic costs of soil degradation processes are difficult to measure but believed to be very high. In 1986, estimates of the on-farm economic impact of water and wind erosion alone stood at between $484 and $707 million annually.

Agriculture has had a significant impact on wildlife and the fate of some species of wildlife is closely linked to agricultural activities. Wildlife habitat destruction, including the draining of wetlands, the clearing of woodlots and shelterbelts, and the conversion of remnant native grasslands to croplands, have all contributed to the loss of wildlife. However, there is now a growing recognition within the farm sector that agriculture can both coexist with wildlife and benefit from maintaining and enhancing wildlife habitat. The retirement of environmentally sensitive marginal lands from annual cultivation will help to increase wildlife habitat.

**Figure 15.**
**Agricultural Pesticide* Application on Cultivated Land in Canada, 1971–1986****



*The area sprayed is counted only once for herbicide and once for insecticide, no matter how many applications are made.
**Data are not available for 1976.

*Source: Statistics Canada, Census of Agriculture.*

Wildlife also has an impact on agriculture. Wildlife causes millions of dollars of direct damage to beehives, orchards, field crops and livestock each year.

Weeds, diseases and insect pests have historically accounted for significant losses in yield across Canada. The dependence on synthetic agricultural chemicals, and their increased use to address these problems has raised concerns. However, increased yields and improved product quality provide benefits to both producers and consumers. For example, synthetic fertilizers can play an essential role in maintaining adequate soil nutrient levels.

Agriculture is also affected by industrial pollution. Water contaminated with salts and toxic chemicals cannot be used for irrigation, and ozone produced in urban areas causes crop damage in parts of Ontario and British Columbia. Acid rain has been recognized as a factor leading to the decline of maple trees which produce the sap used to make maple syrup in Quebec and other parts of eastern Canada. The agriculture industry itself contributes to industrial pollution, in particular to pollution of surface waters through food processing wastes and runoff containing manure and pesticides.

In the short run, Canada's agricultural industry is not seriously threatened by any of the environmental challenges that currently face the sector. Most of the environmental issues important in other developed countries are also present in Canada, although generally at much lower levels of intensity. Nevertheless, issues such as the narrowing of the genetic resource base for agricultural crops and livestock, global warming, stratospheric ozone depletion, acid rain, and impacts of agriculture on wildlife continue to be important.

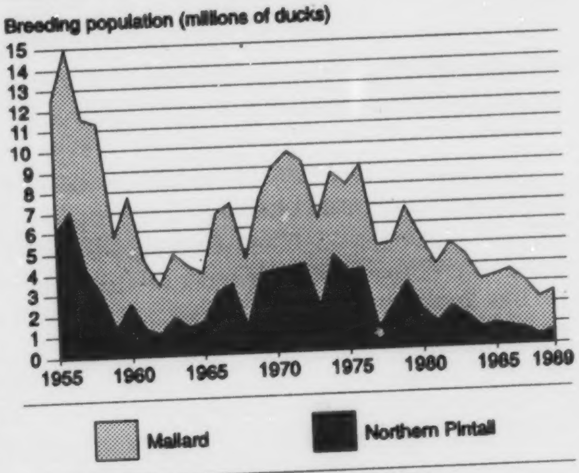
The agriculture sector faces many challenges in ongoing efforts to improve its long-term environmental sustainability. However, progress is being made. A cross-section of agriculture sector stakeholders, along with the federal and provincial governments, have together developed an environmental action plan. New technologies are leading to better soil and water conservation and less environmentally damaging pesticides. Co-operative agreements between farmers and other interests are leading to preservation of wildlife habitat on agricultural lands, and better manure handling systems are reducing water pollution. Continued effort involving many interests will be required to achieve the balance necessary to make agriculture both economically and environmentally sustainable.

### Wildlife and Biodiversity

Canada is blessed with a rich abundance of wildlife, distributed across the country. Wildlife provides Canadians with a number of important benefits. Wildlife is the main source of food for some aboriginal peoples and for other Canadians. To many Canadians, wildlife provides valued recreational activities, and a source of spiritual enrichment. Birdwatching is estimated to be the second most popular pastime in Canada, next to gardening. Sport hunting is extremely popular in parts of Canada, and servicing this industry provides many Canadians with jobs and incomes.

Relative to many parts of the world, the overall the state of Canada's wildlife, which includes all its species of living organisms, is fairly good. Nevertheless, to maintain this status, Canadians will have to be diligent, because there are some problem areas. The most acute problem concerns the list of endangered, threatened and vulnerable species in Canada. We are not at all proud of the fact that ten native Canadian species have become extinct and an additional nine have been extirpated.

**Figure 16.**
**Breeding Populations of Prairie Mallard and Northern Pintail**



*Source: Environment Canada, Canadian Wildlife Service, Migratory Birds and Wildlife Branch.*

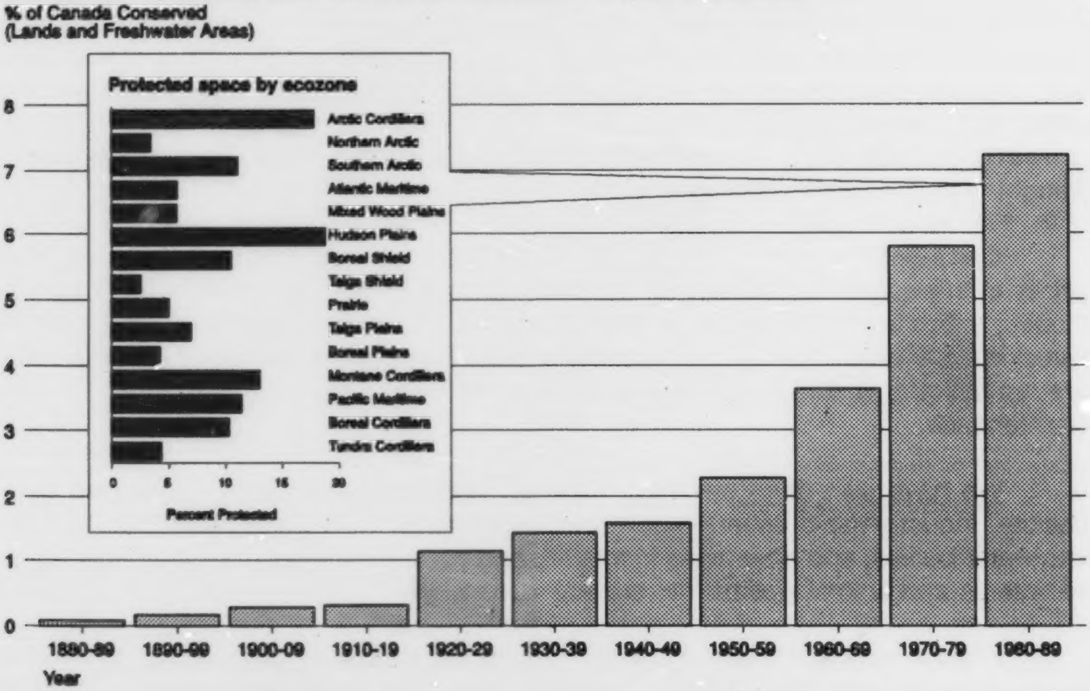
There are other areas of concern as well. Wildlife habitat and natural areas are being lost to urban, agricultural and industrial activities, and natural ecosystems are being degraded by pollution. In general, human activities are increasing the stress on the populations of a number of species. For example, poaching and other human pressures including resource extraction and urbanization are putting increased pressure on our populations of large carnivores, including bears, wolves, cougars and other members of the cat family. The accumulation of toxic substances are affecting the populations of a number of species, including beluga whales in the St. Lawrence and fish in the Great Lakes. Breeding duck and other waterfowl populations on the prairies are under pressure and have declined in recent years. A number of songbirds are showing signs of decline, including some warblers, orioles, tanagers and thrushes, which spend their winters in tropical areas and the southern United States and their summers in Canada. And evidence is emerging that some species of amphibians, including some frogs and toads, are declining in numbers in Canada as they are in the rest of the world. The reasons are not completely clear, but nearly all declines can be linked to the activities of human beings.

On the other hand there are some good news stories as well. Ongoing programs to save and reintroduce endangered species into their former ranges, coupled with extensive scientific research and effective laws are meeting with some success. Peregrine falcons are starting to show some signs of recovery. White pelicans have been removed from the endangered species list, and while by no means assured of survival, whooping cranes have increased in numbers. Populations of deer, moose and other large herbivores are in fairly good shape in many areas of the country, with the possible exception of some caribou populations, and some groups of native sheep in the western mountains.

While it is particularly difficult to assess the risk of loss of biodiversity and associated costs, people around the world have come to believe that there is a substantial risk to the long-term survival of humans as a species if their actions bring about a major loss of biological diversity. We can provide some measure of "insurance" against this happening by setting aside and protecting ecosystems. By permitting only natural processes to influence or change them, protected ecosystems are able to retain the basic elements of Canada's biodiversity for many generations. Many believe that at least 12 percent of Canada's lands and waters should be set aside to provide this insurance. Brundtland first suggested that 12 percent is the appropriate amount, and Canada's Green Plan makes this figure the national goal of the Government of Canada working in co-operation with the provinces and territories.

Canada's national parks, provincial parks, wildlife reserves, and ecological reserves play a critical role in preserving representative portions of Canada's biological diversity. Over the years, the amount of land receiving some form of protection has increased significantly. By 1990, about 722,000 square kilometres, or about 7 percent of Canada's territory, falls under the general definition of "conservation areas". While definitions vary as to what constitutes truly protected areas, conservative estimates place the amount of protected land at about 3.2 percent of Canada's territory.

**Figure 17.**
**Federal, Provincial, and Territorial Protected Areas in Canada**



*Source: Environment Canada, SOE Report 91-1.*

Increasing the amount of protected space will be challenging, because setting aside lands has certain economic costs. This action has the potential to threaten the economic fabric of certain resource-dependent communities, and increased enforcement of wildlife laws will reduce the access some people have to wildlife for food or other economic gain. Nonetheless, Canadians want to ensure that Canada's contribution to the world's biodiversity is maintained.

### Fresh Water

Fresh water permeates the existence of Canadians in every facet of their lives. In our homes, we drink it, cook with it and wash with it. For recreation, we swim in it, fish in it and paddle canoes on it. To our industries which use enormous quantities of it in their operations, fresh water is clearly of immense importance.

When they think of Canada, many people picture vast numbers of lakes and mighty rivers. To some extent this perception is accurate. Eight percent of Canada's territory is covered by bodies of fresh water. It is not evenly distributed, however. The bulk of Canada's water resources are located in the north, away from the majority of Canada's people. In the south, some areas are quite dry. In parts of the Prairies and in southern B.C., an extensive network of canals and dams has been developed to provide water for cities, agricultural irrigation and industrial uses. In some of the driest areas, economic growth is constrained by the availability of water. Efforts to increase its supply have been fraught with controversy in recent years.

Canadians consume vast quantities of water. Spurred on by some of the lowest prices in the world, regional supply problems are aggravated by an increasing demand. Coping with these pressures has meant that provincial and local governments must invest in expensive treatment and transportation facilities. And the low prices we charge are not bringing in sufficient revenues to meet the costs of new infrastructure or needed maintenance.

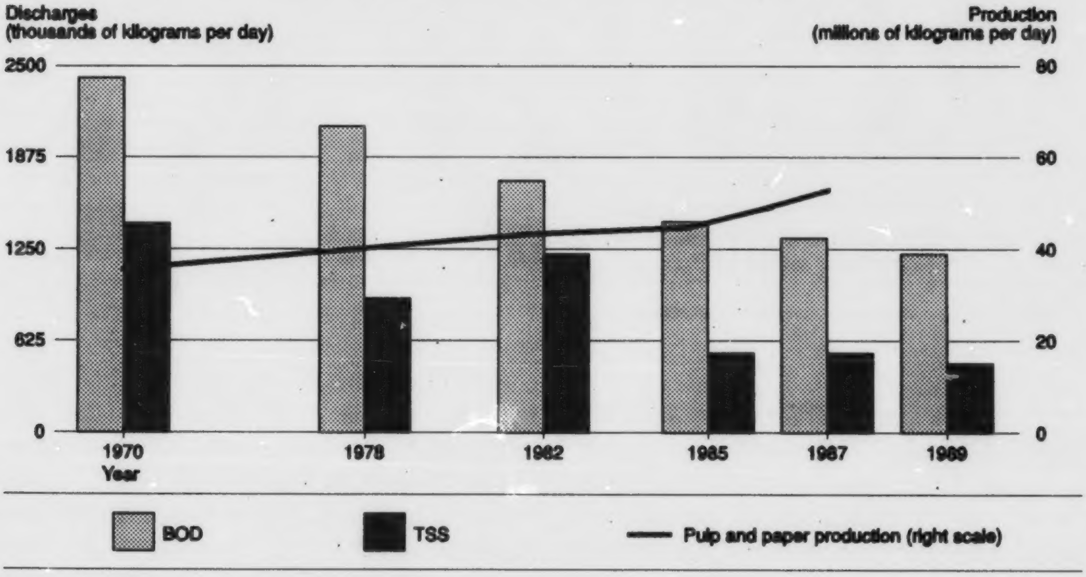
We have also used our fresh water to flush away the wastes produced by our society. Industry has dumped its unwanted byproducts into it, cities have poured sewage into water bodies, and operations in forestry and agriculture have dumped huge loads of sediments and animal wastes into surface waters.

Definite trends in the state of our waters are difficult to pinpoint. On the whole, some areas of water quality have improved, and some have deteriorated. Others are showing little change.

One example of a success story is the partial recovery of Lake Erie. In the early 1970s, nutrient-loading from both Canadian and American sources had severely damaged it. Concerted effort by many interests resulted in substantial recovery of the lake. By the late 1980s, it was a functioning ecosystem once more. Commercial fishing for some species was again possible.

Another success story is the decline of certain emissions to our fresh waters from two important industries, the pulp and paper industry and the oil refining industry, from the early 1970s. Discharges of total suspended solids (TSS) and biological oxygen demand (BOD), two important discharges from the pulp and paper industry, declined by 67 and 50 percent, respectively, between 1970 and 1987. Over the same period pulp and paper production increased by about 47 percent.

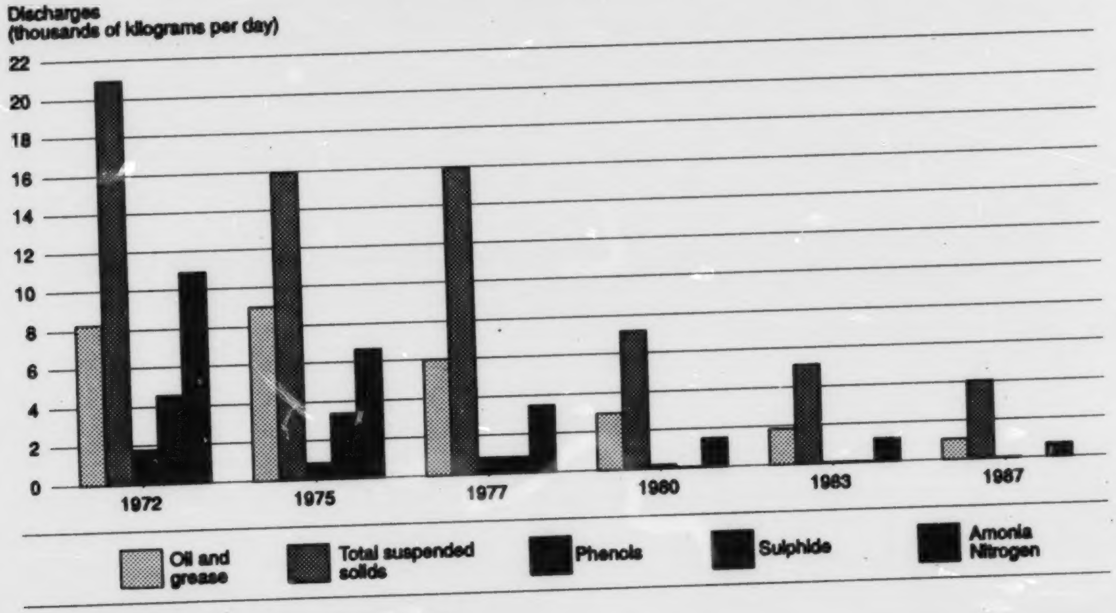
**Figure 18.**
**Pulp and Paper Mill Discharges to Fresh Water: TSS (total suspended solids) and BOD (biochemical oxygen demand)**



*Source: Environment Canada, Industrial Programs Branch.*

National net discharges of TSS, oils and grease, ammonia, phenols and sulphides by the Canadian petroleum refining industry have all decreased markedly between 1972 and 1987.

**Figure 19.**
**National Net Discharges of Liquid Waste by the Canadian Petroleum Industry**



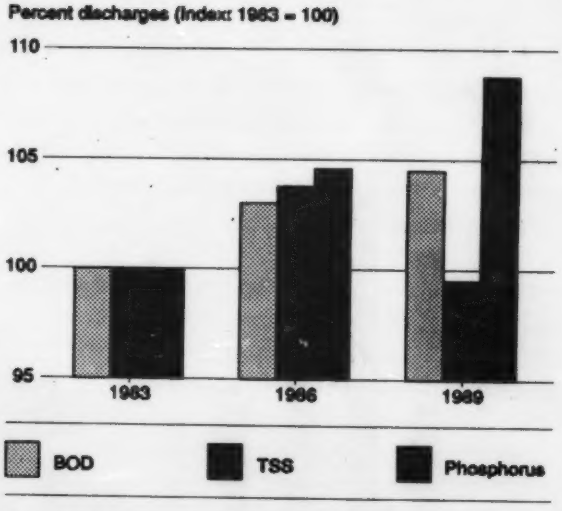
*Source: Environment Canada, Industrial Programs Branch.*

Municipal discharges to freshwater systems on the whole have increased since 1983. Canada's population has grown by about 6 percent over the same period, and although the proportion of the population served by sewage treatment has increased to 73 percent in 1989 from 66 percent in 1983, discharges of phosphorous have increased by about 9 percent, and BOD by about 5 percent.

Concentrations of some pesticides in freshwater bodies in agricultural areas of Canada are relatively high, but the trends are not very clear. For example, the maximum observed concentrations of the herbicide atrazine have been consistently above Ontario water quality guidelines in southern Ontario's Thames River. Levels of 2,4-D in the Bow River, downstream from Calgary, Alberta, have ranged between 10 percent and 50 percent of Prairie Provinces Water Board water quality guidelines.

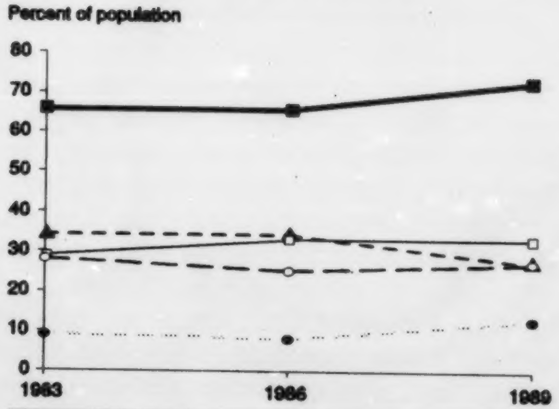
One of Canada's most serious water quality problems is the existence of persistent toxic substances in many of our freshwater ecosystems. Originating mainly from industrial sources, these substances have been accumulating in our aquatic ecosystems for many years. Over the past 20 years, scientists have learned much about the detrimental effects on the environment. We know that barely detectable amounts of some chemicals can remain in the ecosystem for years and build up in the tissues of plants and animals, some of which Canadians depend on for food. According to *Toxic Chemicals in the Great Lakes and Associated Effects*, a report published in March 1991 by the Government of Canada, persistent toxic chemicals and heavy metals are present in many Great Lakes ecosystems in concentrations that are affecting the ability of some wildlife species to survive. Although the exact risks to humans are difficult to assess, it is becoming clear that in some areas of the Great Lakes basin, elevated levels of contaminants do pose a threat to human health.

**Figure 20.A.**
**Municipal Discharges to Fresh Water: BOD (biochemical oxygen demand), TSS (total suspended solids), and Phosphorus**



*Source: Environment Canada, MUD database, for sewage flow data; Waste Management Branch, for waste removal coefficients.*

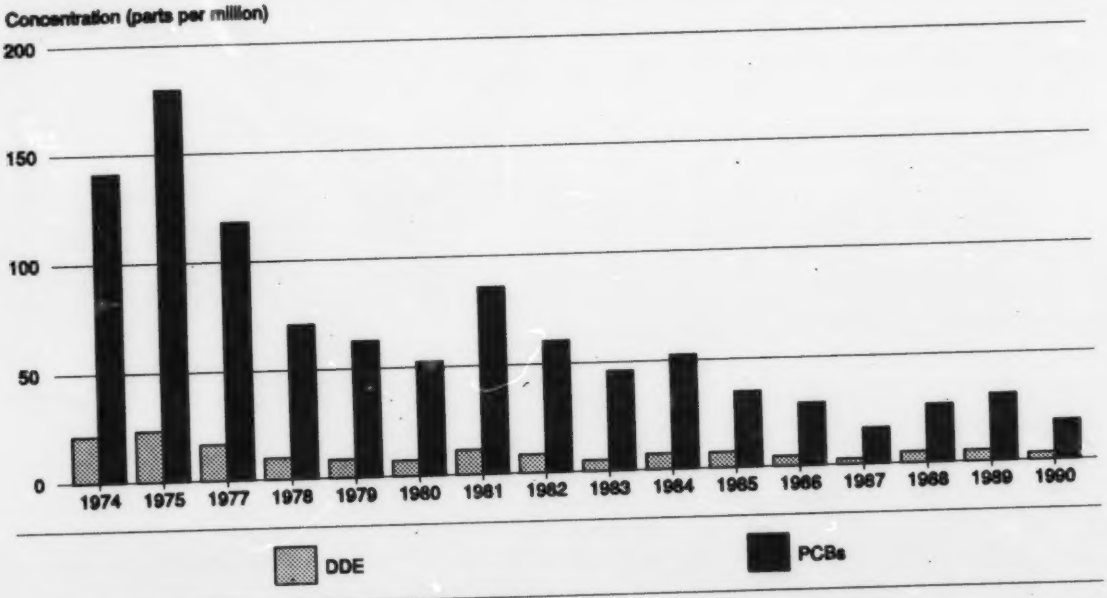
**Figure 20.B.**
**Percent Municipal Population Served by Municipal Sewage Treatment***



*For communities with populations over 1000.
**Includes population served by sewers but with no sewage treatment.
*Source: Environment Canada, MUD database*

As a measure of the problem, PCB and DDE levels have been measured in herring gull eggs in the Great Lakes basin. While levels have declined since 1974, they began to level off in the 1980s.

**Figure 21.**
**DDE and PCBs in Herring Gull Eggs: Snake Island, Lake Ontario**



*Source: Environment Canada, Canadian Wildlife Service, Ontario Region.*

Canadians strongly support the need for better control and management of toxic and hazardous substances from the beginning to the end of their product lifecycles. This includes all aspects of their production and use — manufacturing, transportation and distribution, end-use and ultimate disposal. Industry, governments, and a wide range of non-governmental organizations and individual Canadians are working together to reduce the health and environmental risks associated with toxic substances.

But there are a number of serious impediments to eliminating the threat of persistent toxic chemicals. Background concentrations of many toxic substances can be found in our water bodies and other ecosystems, and would be very difficult to remove. In addition, a good proportion of emissions which end up in Canadian ecosystems comes from other countries. For example, toxic substances in Canada's Arctic come from as far away as Eastern Europe and South America. Radioactive pollution from the 1986 Chernobyl nuclear accident in the USSR contaminated Arctic lichen and caribou.

Toxic contamination of the environment is extremely important for aboriginal people in Canada. They are at greater risk from toxic contamination because they are more dependent on harvested "country" foods than the rest of Canadians. Mercury and other toxic substances are accumulating in the environment, particularly in the Arctic and in areas flooded for hydro-electric power generation. Because of the potential health risks, this contamination is seriously affecting their ability to rely on traditional sources of food.

The fact that it will be difficult to reduce the levels of toxic substances does not mean that we should shrug our shoulders and turn our attentions elsewhere. On the contrary, what it means is that we will have to work harder to achieve measurable reductions. Canadians are anxious to see improvements and are ready to work together to reduce emissions of toxic substances, and to clean up existing contaminated areas.

In some parts of Canada, rising populations and ongoing economic activities mean that demand for water will continue to grow. To some extent this demand can be offset by conservation measures and higher prices, but conflict over supply will be a fact of life. A number of other water issues will be easier to address. Although expensive, improving municipal sewage treatment is relatively straightforward. Industrial emissions are declining, and new laws, strictly enforced, in combination with ongoing co-operative efforts with industry, make the outlook for reducing many forms of water pollution quite bright. Runoff from urban areas and farms can also be controlled, and efforts are increasing in these areas. Over time, Canada should be able to improve the condition of what could be its most precious resource; fresh water.

## Marine Ecosystems

Canada's oceans provide incredibly rich natural habitats, resources and environments that sustain many uses. They contribute more than $8 billion to the national economy and provide Canadians with more than 1 million jobs. However, the oceans have been traditionally seen as a global "common" area — exploitable by all nations but the responsibility of none.

As a result our marine ecosystems are showing the same signs of stress as many other parts of the environment. The ocean is being polluted by emissions from point sources such as industrial and sewage facilities, and from diffuse sources such as fertilizer and pesticide runoff from agricultural activities, as well as pollutants carried long distances by wind and water. Litter, including discarded plastic debris from fishing operations and other sources, is contributing to a problem which is killing fish, seabirds and marine mammals in increasing numbers.

Oil and chemical spills are an important factor in marine environmental quality. It is an unfortunate fact that pollution accidents are inevitable in an economy like Canada's which is so dependent on substances such as oil and chemicals. Nevertheless, we are still shocked by the life-threatening stresses we place on the environment by the accidental release of oil and chemicals. In 1988, the Nestucca oil spill fouled one of the finest beaches on the west coast of Vancouver Island and killed thousands of seabirds.

While we cannot completely *eliminate accidental releases of* oil and chemicals, we can reduce the frequency at which they occur, and we can minimize the environmental damage. Governments and industry are working together to accomplish just that — reduce the incidence of environmental catastrophes within Canada, and increase the level of preparedness to respond faster and more effectively to spills throughout the country.

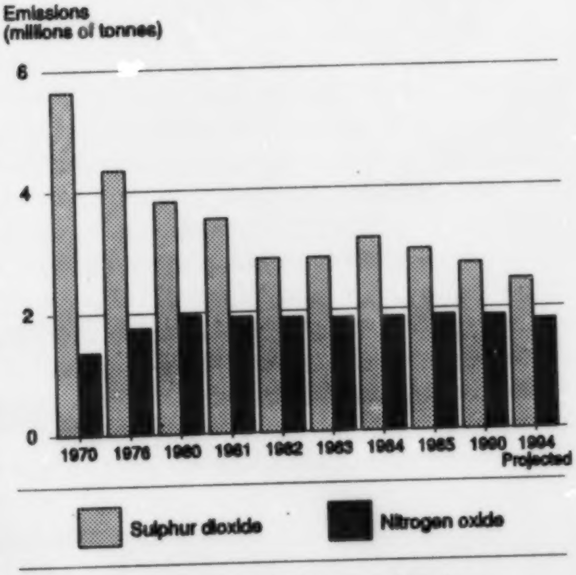
### Air

Canada's air quality has seen a number of important improvements over the last twenty years. At the same time, however, air pollution problems exist that represent many of the most serious challenges to the long-term health of Canada's and the world's environment.

Lead levels in urban air have decreased from a high of almost 0.7 micrograms per cubic metre in 1974 to a low of less than 0.05 in 1989, a decrease of more than 90 percent. This major decline is mostly attributable to the decrease in the use of leaded gasoline in Canada. In December 1990, the use of leaded gasoline was phased out.

Acid rain has long been a serious air pollution problem in much of eastern Canada: it kills fish and other aquatic life, injures trees and other plants, and damages buildings and monuments. Quite literally, acid rain was destroying our heritage. As a result of co-operative government-industry efforts, sulphur dioxide emissions, the main cause of acid rain, have decreased in Canada from a high of almost 6 million tonnes per year in 1970, to under 3 million tonnes in 1990, despite the growth in the Canadian economy. Recent action in the United States will decrease sulphur dioxide emissions in that country as well. This is

**Figure 22.**
**Sulphur Dioxide ($SO_2$) and Nitrogen Oxides ($NO_X$) Emissions in Canada**



*Source: Environment Canada, Industrial Programs Branch.*

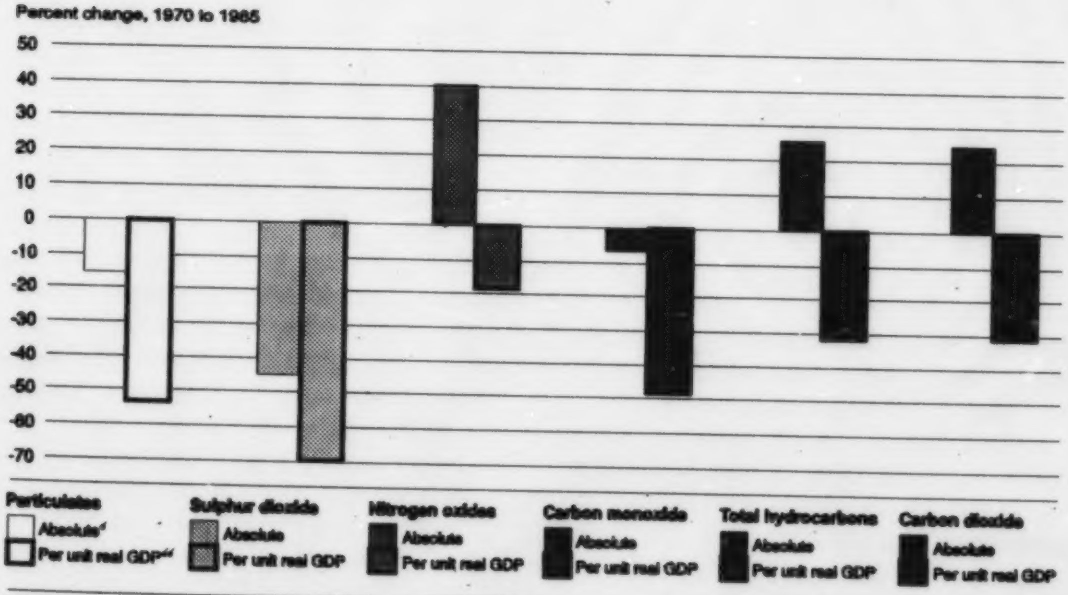
important, because it has been estimated that the emissions causing 50 percent of all acid rain falling on eastern Canada come from the United States.

While this by no means implies that the stress to the environment caused by acid rain has been eliminated, it does mean that we are making major progress. Co-operative action between *governments, private citizens, and industry* are responsible for this improvement. Some of our efforts can now be focused on bringing life back into dead lakes and rivers.

Stratospheric ozone protects us from the harmful component of sunlight. Depletion of the ozone layer due to emissions of CFCs and other ozone depleting substances poses major threats to life on this planet. Although countries around the world are taking action on this issue initiated by the *Montreal Protocol on Substances that Deplete the Ozone Layer*, recent scientific evidence indicates that the situation continues to deteriorate.

Ground level ozone, the major component of urban smog, poses problems for the health of some Canadians and affects agricultural crops and trees in parts of Canada, particularly in the Quebec City-Windsor corridor, the Vancouver area of British Columbia, and around Saint John, New Brunswick. There have been no obvious trends in ambient levels of ozone in recent years, indicating neither major improvements nor deterioration.

**Figure 23.**
**Change in Selected Air Emissions**



*Absolute change indicates total change in emission between 1970 and 1985.
**Per unit real GDP indicates the change in emissions between 1970 and 1985 per unit of real GDP.
*Source: Environment Canada.*

However, in 1988, people in several major Canadian cities were advised on certain days to stay indoors and limit outdoor physical activities.

The outlook for many of these problems is mixed. Except for ground level ozone, urban air quality on the whole is improving. And overall, Canada's economy is becoming cleaner from an air pollution perspective. On a per unit of GDP basis, emissions of particulates, sulphur dioxide, nitrogen oxides, carbon monoxide, carbon dioxide, and total hydrocarbons all decreased from 1970 to 1985. However, in absolute terms, we are not doing so well. Only emissions of sulphur dioxide have improved markedly. Sulphur dioxide emissions are expected to decline further and emissions of CFCs will decline; however, as our cities get bigger, and our economy grows, continued improvements are not assured in the absence of continued government, industry and individual action.

Of all the important environmental issues which Canada faces, none has the potential to produce environmental damage and economic disruption on a massive scale as global warming. In addition, not many issues have as wide a range of views as to what Canada should do about it. The environmental implications of global warming are often described in biblical terms — huge floods of low-lying coastal areas, more intense storms, droughts, widespread crop failures and famines. In economic terms, whole industries could change radically or disappear completely, with the consequent loss of jobs and economic activity. In the words of the short consensus statement of the Conference on the Changing Atmosphere: Implications for Global Security, held in Toronto in June 1988: "Humankind is conducting an unintended, uncontrolled, globally pervasive experiment whose ultimate consequences could be second only to global nuclear war."

Scientists are in general agreement that climate change will occur and that it could have serious consequences. However, there are still many scientific and socio-economic uncertainties as to the extent and pace of change. But there is consensus that the risks associated with inaction on greenhouse gas emissions are too great to wait upon the results of further research before tangible steps are taken to address the problem. This "precautionary principle" was expressed in the Ministerial Declaration of the Second World Climate Conference held in November 1990 in Geneva.

In global terms, Canada is a small contributor to global warming, producing only 2 percent of the planet's carbon dioxide emissions. On the other hand, when compared on per capita basis, Canadians rank second after the United States in production of greenhouse gases. In large part, this is because Canada's rich endowment of energy resources has led to the development of an energy intensive economy — in essence, capitalizing on its comparative advantage. It is also because Canada has a cold climate, and because its economic output contains a comparatively large transportation component. It may also be in part because Canada has not concentrated on energy efficiency to the same extent as countries like Japan and Germany. When these countries were adjusting to the oil price shocks in the 1970s by improving the energy efficiency of their economies, Canada was protected behind artificially low oil prices. As a consequence, there was little economic incentive to improve its efficiency, and it fell behind.

There are a number of views in Canada about how far and how fast Canada should move on global warming. Much of Canadian industry believes that Canada should not move faster that its trading partners in order to maintain the country's competitiveness. Some provinces whose economies would be affected by moves to cut greenhouse gases at a rapid pace are also in favour of a measured approach. On the other hand, the environmental movement is impatient with what it perceives as a lack of progress towards reducing Canada's emissions of greenhouse gases.

## Energy

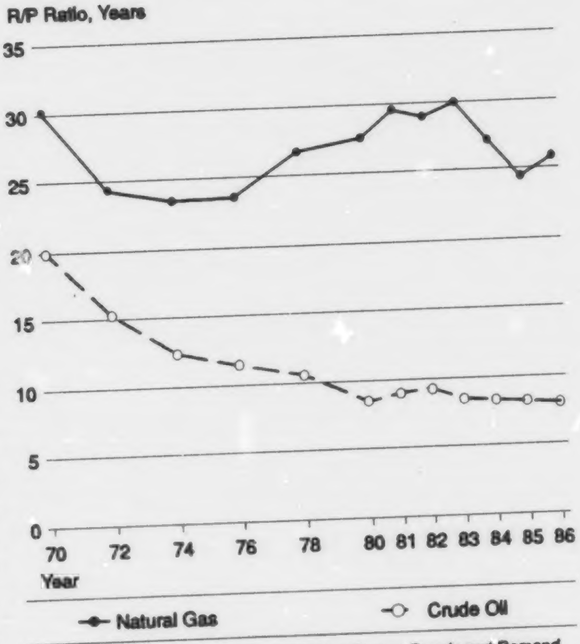
Production, transportation and consumption of energy has an enormous influence on both Canada's economy and its environment. Canada is richly endowed with energy resources, and the structure of its economy reflects this fact. At the same time, the energy sector contributes to environmental problems on both a national and global level.

Canada has significant reserves of oil, natural gas, uranium, coal and undeveloped hydro-electric sites. We produce about 4 percent of the world's primary energy supply, and we are the second largest energy producer in the Organization for Economic Co-operation and Development (OECD). During the period 1983 to 1987, the energy sector represented an average of 7.1 percent of Canada's GDP, 11.8 percent of its export income and 3.7 percent of all jobs.

Both energy supply and end-use demand differ greatly from province to province. The four western provinces produce oil, gas, coal, uranium and hydro-electricity in excess of their needs. Alberta's reserves of oil and gas have been the backbone of its economy since the oil strike at Turner Valley in the 1920s. Canada's territories contain large undeveloped oil and gas fields. Ontario imports oil, gas and coal to power its industrial base, and obtains the largest portion of its electricity from nuclear power plants. Quebec produces vast quantities of hydro-electric power, imports some from Labrador, and exports electricity to the United States. The province also imports oil and gas from western Canada, and oil from abroad. The Atlantic provinces have no access to natural gas and import most of their oil from abroad, but Nova Scotia and New Brunswick have coal and there is considerable hydro production in Labrador. There are also significant reserves of oil and gas offshore.

Since 1970, remaining reserves of natural gas have increased in Canada at a rate that has kept pace with increasing production rates. Reserve additions and technological advancements have been enough to keep Canada's key reserves-to-production ratio hovering at 25 to 30 years between 1970 and 1986, excluding offshore reserves and recent huge natural gas finds in Alberta. Canada exports major quantities of natural gas, although its exports have declined relative to total gas production.

**Figure 24.**
**Natural Gas and Crude Oil Reserves to Production Ratios**



*Sources: National Energy Board, Canadian Energy Supply and Demand 1987–2005, Ottawa, September, 1988.*

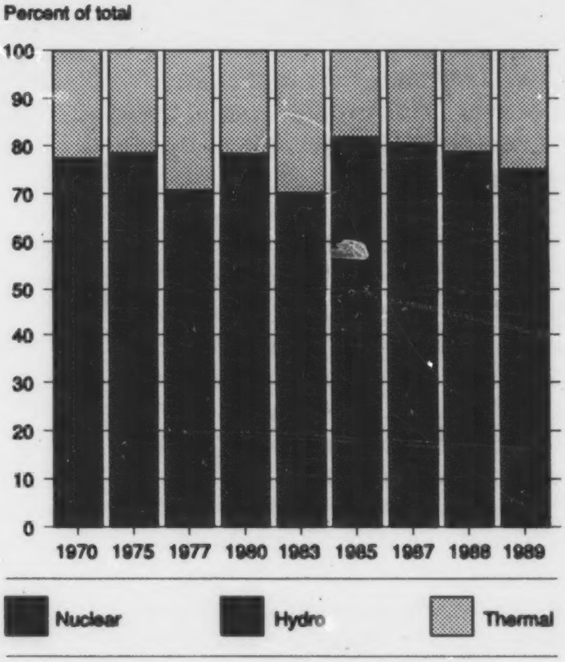
Petroleum reserves have not fared quite so well, although the reserves-to-production ratio has stabilized at around 8 years, indicating that reserve additions are keeping pace with production. The quality of Canada's crude oil reserves is changing, however. The proportion of Canada's crude oil reserves made up by light crude is declining, and by heavy crude increasing. Oil reserves data used in figure 24 do not include either Canada's significant, albeit costly to produce, offshore oil reserves or the petroleum locked up in Alberta's vast tar sands reserves. Canada is currently a net exporter of oil.

Canada has substantial reserves of coal, including metallurgical and thermal coal. Canadian coal represents over 80 percent of Canada's remaining fossil-fuel reserves. British Columbia has about 80 percent of Canada's reserves of metallurgical coal. B.C., Alberta and Saskatchewan account for a total of 93 percent of Canada's thermal coal reserves. Overall, Canada's existing reserves of coal are large enough to last over 100 years at current rates of production. More than 40 percent of Canadian coal production is exported, mainly to satisfy Japanese and Korean steel industry needs for metallurgical coal. About 95 percent of domestic consumption of coal is used for electricity generation.

Canada produces, consumes, and exports a significant amount of electricity. Production has grown about 5 percent per year, on average, between 1970 and 1989. Consumption growth has been about the same over the period but slowed markedly to about 2.5 percent in 1989 over 1988. Canada's net exports of electricity have varied ranging from almost 18 percent of production in 1983 to a low of about 1 percent in 1970 depending on available production surpluses. The high represented the excess power generated by the massive James Bay Phase 1 project in Northern Quebec which was just coming on stream.

The mix of electric power generation has changed in Canada. Nuclear energy has increased from only 0.05 percent of production in 1970 to a high of 16 percent in 1988, mostly on account of Ontario's decision (currently under review) to use nuclear power for new additions to its generating capacity. Thermal production has remained relatively constant, while hydro-electric generation has shrunk from 77 percent in 1970 to 60 percent of the total electric power generated in 1989. Total generating capacity has increased from 42.8 to 101.0 gigawatts over the period.

**Figure 25.**
**Electrical Generating Capacity by Type**



*Source: Energy, Mines and Resources Canada, Electric Power in Canada 1988*

The potential environmental consequences of energy are pervasive. They are present in all phases of the energy cycle, from the methods used to extract and transport resources, to the generation of electricity, right through to the end use. Mining of coal and the tar sands damages the land and can acidify surface waters. The need to transport oil from producing areas to markets leads to oil spill pollution emergencies. The end use of fossil fuel-based energy produces carbon dioxide, the most important greenhouse gas, as well as nitrogen oxides and volatile organic compounds which produce smog.

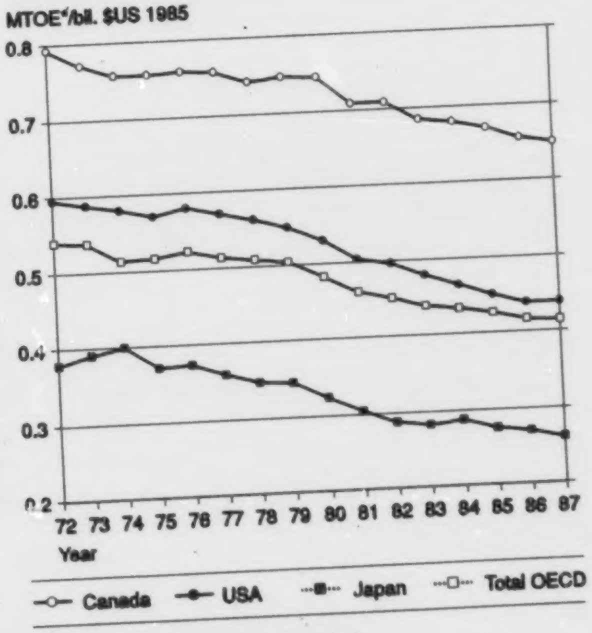
The production of electricity has a wide range of potential impacts, depending on the generation option. Hydro-electric development floods extensive areas, displacing people and wildlife and increasing environmental mercury loadings. Nuclear energy has safety risks associated with the entire uranium cycle, from mining through processing to the ultimate disposal of high-level radioactive waste. In addition, there are safety risks associated with the reactors used to generate electricity from uranium. And the use of fossil fuels to drive conventional thermal generation produces carbon dioxide and waste heat.

From a domestic consumption point of view, the least environmentally damaging energy option is energy efficiency. In addition, energy efficiency can be a good investment. Faced with the enormous costs of building new generating facilities, electrical utilities throughout Canada are aware of both the environmental and economic benefits of energy efficiency and many are actively promoting it. While some people believe that we should dramatically increase our efforts in this direction, there is little doubt that it will have a major role to play in Canada's future energy profile.

On the whole, the energy intensity of the Canadian economy has declined over time. Between 1972 and 1988, energy use per unit of GDP declined by about 1.3 percent per year. However, growth in the economy has more than offset these gains and energy consumption has increased by about 1.5 percent per year over the same period.

Despite efforts to increase energy efficiency and the recognition of its essential contribution to the solution of such problems as global warming, overall growth in energy consumption is expected to continue. Canadians will have to make difficult choices in the coming years. At some point, we will need to add generating capacity to our systems, and we will have to choose between the available options. New, cleaner technologies such as solar energy may help, but the hard fact is that to a large extent we will have to rely on either thermal, hydro, or nuclear energy in the future. In addition, energy projects for both export and domestic supply provide jobs and economic wealth to the country, and are especially important in some regions of Canada:

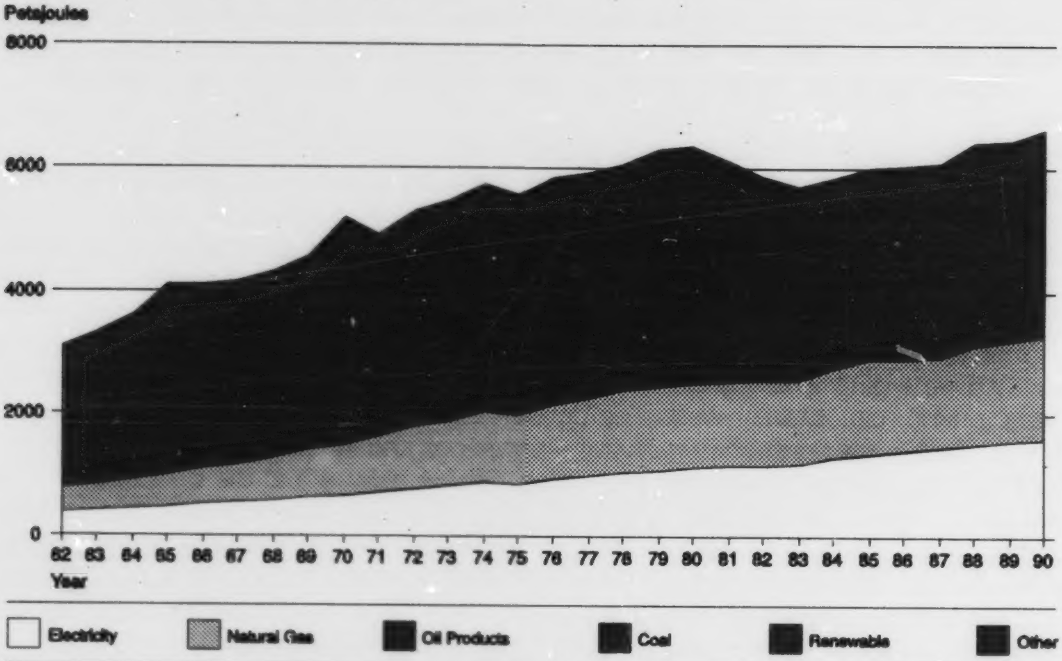
**Figure 26.**
**Primary Energy Use Per Unit of GDP**



*MTOE = millions of tonnes of oil equivalent.

*Source: International Energy Agency, 1991.*

**Figure 27.**
**Secondary Energy Demand by Fuel**



*Source: Energy, Mines and Resources Canada; Energy Use and Atmospheric Change - A Discussion Paper, August 10, 1990.*

## Minerals

Canada leads the world in value of mineral exports and ranks fourth among the diversified mineral producers in non-fuel mineral production. The industry is highly diversified with over 60 different mineral commodities produced. On a volume basis, Canada ranks first in the production of uranium and zinc, and second in nickel, asbestos, gypsum, potash and sulphur. It is among the top five in the production of gold, copper, lead and a number of other metals.

In terms of importance to the Canadian economy, the minerals industry represents about 2.1 percent of employment and although down from 4.6 percent of GDP in 1975, in 1989 the industry still represented a significant proportion of Canada's GDP at 4.3 percent. Overall, the outputs of the metal and non-metal mining industries have grown in real terms since 1981. Although the industry is widely distributed across the country, it is particularly important to the economies of the northern parts of a number of provinces, including Ontario, Quebec, and Manitoba. Mining is also important in B.C., Saskatchewan and both territories.

For the most part, stocks of some key minerals in Canada have either increased or remained relatively constant, indicating that reserve additions are keeping up with production. Reserves of gold, for example, have increased by over 100 percent from 1983 to 1990 — from around 800 kilotonnes to over 1,700 kilotonnes. Reserves of zinc have slipped by about 20 percent since 1983, but have rebounded by 4 percent since 1988.

The environmental impacts of mining are quite diverse. Acidified mine wastes, particularly mine tailings, have long been associated with mining operations. Uranium mining presents special problems due to the radioactive nature of mine tailings. Smelting operations involving high sulphur metal ores are one of the leading sources of sulphur dioxide, the main source of acid rain.

An emerging and significant environmental issue involving the mining industry relates to land use. Many new mining developments are being proposed in wilderness lands located in the northern part of some provinces and in the territories. Others are in lands that are claimed by aboriginal peoples. Some believe that the best use for these lands is to remain wilderness, and that mineral development should be curtailed. Aboriginal peoples believe that they should be full partners in development decisions on claimed lands. Mining companies, on the other hand, believe they have legitimate claims to the resources. Any further land preservation in mineral-rich areas removes land from the industry's resource base and reduces commercial opportunities.

These decisions are important because they affect Canada's economy and the environment. The mining industry is an important contributor to the economy of Canada. In order to continue to provide jobs and wealth for Canadians, they need access to new reserves. However, opportunities to preserve wilderness are shrinking around the globe, and Canada has some of the best wilderness lands left in the world. Aboriginal peoples in Canada have legitimate claims on some of the lands as well.

Accommodating these many demands will not be easy. Like many of the questions involving the use of resources, a balance between economic and environmental objectives will have to be sought. New co-operative mechanisms will be needed, and new rules established. Tradeoffs must be made by all sides so that Canadians can make both economic and environmental progress.

## QUALITY OF LIFE

As a small population with a large land mass, Canadians have access to relatively unspoiled wilderness areas rich in wildlife, and enjoy a thriving cultural and artistic milieu. Canada has an international reputation as a beautiful, safe and mostly unspoiled country. At the same time, Canada's economy remains strong with a productive industrial base that, on an overall basis, provides Canadians with a high standard of living. An advanced set of social programs including health care, income assistance, and education is provided by three levels of government — federal, provincial/territorial, and municipal. Overall, Canadians enjoy a standard of living and a quality of life that is among the best in the world.

In fact, according to the United Nations Development Program 1991 Human Development Index, Canada ranks second in the world, just behind Japan. The index is based on three main components: life expectancy, literacy, and basic purchasing power. Canada ranks high because our life expectancy is among the highest in the world, higher education is readily available to Canadians, we have a good health care system, and Canadians, on the whole, are reasonably well off. Table 3 provides some quality of life indicators.

TABLE 3

QUALITY OF LIFE INDICATORS

| | 1972 | 1976 | 1980 | 1984 | 1986 | 1988 |
|---|---|---|---|---|---|---|
| Life Expectancy at Birth, Years | | | | | | |
| Males | 69.6 | 70.3 | 71.6 | 72.9 | 73.0 | - |
| Females | 75.6 | 77.7 | 78.8 | 79.8 | 79.7 | - |
| Spending on Health Care as % of GDP | 7.0 | 7.1 | 7.3 | 8.4 | 8.3 | - |
| Spending on Education as % of GDP | 8.0 | 7.6 | 7.2 | 7.2 | 7.3 | - |
| Violent Crime Rate, per 100,000 | 506.0 | 592.5 | 652.0 | 714.0 | 808.0 | 897.0 |

There is room for improvement, however. According to the UN report, female workers earn 63 percent of male wage rates in Canada, and women make up only 22 percent of university science graduates. In 1988, about one in six Canadians were living below the poverty level. In addition, data compiled between 1980 and 1985 indicates that Canada has the world's highest incidence of drug-related crimes, well above the rate experienced by the United States over the same period. And in some parts of Canada, declining ecological integrity is giving rise to concerns about long-term health effects.

Many aboriginal Canadians do not share the same quality of life as other Canadians. Unemployment in some communities is as high as 50 percent, and social indicators such as infant mortality and suicide are significantly higher than national averages.

## OUTLOOK

### *Economic Prospects*

Slowing labour force and labour productivity growth due to demographic factors indicate that in the future, Canada will likely experience slower economic growth. Where the "baby boom" led to rapid increases in the growth of the Canadian labour force in the past, demographic fundamentals suggest that labour force growth will slow. And while the structural policy reforms instituted in the last several years (energy deregulation, the Canada-U.S. Free Trade Agreement, deregulation of the transportation sector, and the Goods and Services Tax) add to productivity prospects as they are phased in, productivity growth will likely increase by an average of only a little more than one percent per year in each of the next three decades. This follows mainly from the dominant weight of services employment in the economy, sectors where measured labour productivity gains are low (health, education and public administration) or very difficult to achieve because of the "personal" nature of the service.

Another factor to consider when evaluating long-term economic prospects is current government policy orientation towards reducing high public sector debt levels. Given this, and the demographic fundamentals, prospects for notable growth of real disposable income, per capita (or household) are limited. There is almost no chance that the growth rates that characterized the 1960s and 1970s — 2 percent per household — can be restored. In short, the growth of incomes that underpin the population's sense of improvement in private well-being will likely be under some pressure for the foreseeable future.

Thus, the very rapid growth that Canada enjoyed through much of the post-war period seems to have little prospect for the next generation. A reasonable baseline growth for the real economy would be in the range of 2.5 percent per year, with growth of 3 percent being at the upper boundary of possibilities.

International economic arrangements (for example, an economic "explosion" as Europe integrates under a regime of liberalized multilateral trading and other economic arrangements) could alter this picture, as did the recovery of Europe and Japan in the years following 1945. But the prospects of this are not strong; further, growth in Asia, and perhaps in Latin America, is as likely to have trade-diverting, as much as trade creating, effects on Canada. Canada will be as sensitive to the external events as in any time in its history, given the industrial strategy of the last twenty years, during which the Canadian economy has been increasingly "opened" to foreign trade.

### *Environmental Prospects*

Several trends in Canada are expected to continue to put pressure on the Canadian environment. Continued population growth, mostly in urban areas, indicates that urban congestion, smog, and land use changes will continue, and demand for water and sewage treatment systems will increase. General economic growth will, over the long-term, increase domestic demand for electricity. And although their growth will slow, there will likely be some growth in the traditional resource-based industries. By itself, this implies an increase in the use of resources such as forests, energy and other nonrenewable resources, and an increase in emissions. And in many of these industries, an increased need to be competitive on a global basis points to the necessity of rationing available resources between this and other important goals, including environmental protection. For governments, high debt loads and limited prospects for increasing revenues through higher taxes or strong economic growth limits their ability to dramatically increase expenditures on the environment.

On the other hand, there is evidence that changes in some areas are occurring. Overall, structural changes in Canada's economy have led to decreased energy consumption and air emissions per unit of GDP, and ongoing actions at many levels should maintain and accelerate this trend. More and more Canadians are now served by sewage treatment facilities, and this trend is continuing. Forest and other renewable resource management practices are changing.

Canadian men and women at all levels of society are becoming aware of the need for change. Environmental information is improving and becoming widely available, and environmental science and technology is providing us with better tools to implement change. Our institutions at all levels are aware of the need for change regarding the environment, and people with widely different views are banding together to work on joint solutions to difficult problems. Finally, given the current emphasis on environmental education in Canadian schools, it is likely that the level of environmental awareness will rise in the future.

Overall, there are reasons to be hopeful that Canada's environment will improve in the future. At the same time, there are still many important and urgent environmental challenges that are demanding our attention, and we will have work diligently to ensure that progress is made, because there are few signs that the environment will improve by itself. And neither should we expect change overnight. Long-term, positive improvements in the way our economic activities affect the environment will take time. Occasionally, in cases where economic and environmental goals are not wholly compatible, compromises will have to be made.

The next section of this document reviews how far Canadians have come to make sustainable development a reality in Canada.

# SECTION TWO: CANADIAN RESPONSES TO SUSTAINABLE DEVELOPMENT

## OVERVIEW

The environmental debate in Canada has undergone a steady evolution since 1972. Sustainable development underlies much of our current thinking about the successful integration of the economy and the environment. To many people, it represents the current end-point in the evolution of the environmental debate in Canada. In all sectors of Canadian society, there has been a growing recognition and acceptance of the urgent need to integrate environmental concerns into the economic structure of society in order to protect the environment while at the same time maintain a high standard of living and quality of life.

In this respect, non-native Canadians have a great deal to learn from the country's aboriginal peoples. Aboriginal Canadians have always expressed their sense of oneness with the natural world. The Inuit saying — "We do not inherit the earth from our fathers; we borrow it from our children" — is at the heart of sustainable development.

In the early 1970s, the Club of Rome, in its major report *Limits to Growth* warned that resources would run out unless we halted economic growth. Many of the central arguments of the Club of Rome's philosophy have since been rejected because they did not factor in a number of important economic principles. Nevertheless, their report raised some very important issues and mobilized a great deal of thought about the linkages between economic growth and the environment. Since then, thinking has evolved not towards halting growth, but towards redefining the nature of growth so that the environment is not compromised through short-sighted and ultimately uneconomical forms of development. In simple terms, we began to realize that we should start living off nature's interest, not its capital.

In the mid-1970s, a movement towards a "conserver society" was gaining in popularity. Its basic thrust was to create a society characterized by an overall reduction in the use of energy, water, air, and other resources. By the mid-1980s, Canadians were ready for a more integrated approach to the environment and the economy; an approach promoted by the World Commission on Environment and Development (the Brundtland Commission).

As our thinking about the nature of the relationship between our environment and economic activity changed, so did our perception of environmental problems. In the early 1970s our common approach to addressing pollution problems consisted of "react and cure". This approach focused on reacting to crises, both real and perceived, and developing solutions to particular problems that may not have been optimal from either a cost or an environmental perspective. We reacted to what we could see — belching smokestacks, foaming streams, and littered riverbanks. Our solution to many of these problems was dilution. We built taller smokestacks to improve local air quality, and we dumped industrial wastes into water bodies to effectively render them invisible. At the time, our level of knowledge in many of these areas was such that we believed that these were the right solutions. A far better approach, and one currently endorsed by a wide majority of Canadians, is to anticipate potential problems before they happen and prevent them. Adjusting our activities to accommodate pollution prevention will require that environmental factors be considered very early in the planning stages of projects, and will require the close co-operation between governments, industry, and other interests.

In part, our increasing knowledge level has driven environmental policy in Canada. The response to one of Canada's most serious environmental problems — the threats posed by persistent toxic chemicals in the environment — is representative of our efforts to keep up with better information and new knowledge. We have only fairly recently learned about the toxic nature of many of the by-products of our industries and about the environment's inability to cope with emissions of some substances. In the past, our ability to measure the concentrations of some substances was limited to parts per million. At concentrations lower than that, we were satisfied that these substances were effectively absent from the environment. With advances in measurement technology, we can now measure the concentrations of some substance as low as parts per trillion and lower. Consequently, we have become aware that the environment contains a variety of potentially dangerous substances.

Over time, it has become widely recognized that many sustainability problems must be approached from an ecosystem perspective. It is a fundamental truth that in the natural world, all things are connected. The complex interdependence of human beings and the air, land, water and other living organisms requires that solutions be developed that recognize this reality. Piecemeal solutions will no longer be enough.

One of the first attempts at using the ecosystem approach in a practical setting was the development of the Great Lakes Water Quality Agreement in 1978. The Great Lakes basin is a region of Canada and the United States that is home to 37 million people and falls under the jurisdiction of two federal governments, eight states, two provinces and a multitude of counties, municipalities and Indian reserves. This Agreement between the United States and Canada encourages the protection and clean-up of the region based on boundaries of nature, rather than political or sectoral boundaries. It recognizes the inter-relatedness of the physical, chemical and biological processes and the need to harmonize the human element with all other elements of the natural system.

Another factor which has emerged over time and which greatly influences our response to sustainable development issues is our recognition of the expanding geographical scope of environmental issues. We have come to realize that pollution respects neither local nor international boundaries. Broader global environmental issues also have our attention. Global warming and stratospheric ozone depletion are competing with domestic issues for our attention and resources. Increasingly, the interconnectedness of global ecosystems is being recognized and solutions are being proposed that rely on co-operative action between countries of the world.

The importance of partnerships to tackle environmental problems represent another aspect of the evolution of Canadian thinking about environmental issues. It was highlighted in the Government of Canada's Submission to the 1972 Stockholm Conference, and continues to be an important theme in many sustainable development strategies, including *Canada's Green Plan*. In the past, Canadians have tended to point fingers at polluters and demand that governments take strong action. Increasingly there is recognition that responsibility for the environment is a shared responsibility, and that co-operative action is needed.

Governments at all levels, industry, and individuals all have custody of the environment, and partnerships between these different levels of Canadian society have emerged as a growing force in Canada's efforts to implement sustainable development. Canadians are aware of the important role that industry and business plays in providing Canada with the wealth it needs to maintain its standards of living. Canadians are also aware that government resources are constrained and that this places limitations on governments' ability to bear the full costs of environmental programs. Consequently, in order to both protect the environment and have economic activity, it is in everyone's interest to work together to develop solutions to environmental problems that minimize costs and permit economic activities to continue. All sectors of society are participating in developing solutions: government, industry, aboriginal peoples, individual Canadians, labour unions, environmental groups, development groups, youth groups, women's groups and others.

Despite the shared nature of environmental responsibility, governments will continue to be called upon for leadership in environmental protection. Canadians as a rule look to governments to set standards and establish priorities, provide accurate, environmental information, encourage partnerships, and to initiate action to protect or clean up the environment. Governments also have an important role in bringing about the integration of the environment and economy. Ensuring that the legal, policy and decision-making frameworks are in place to encourage sustainable development is a crucial function of governments at all levels.

## THE RESPONSE OF GOVERNMENTS

### Trends in Environmental Policy

The concept of environment and economy interdependence is not new; it can be traced back to the early seventies, and to the 1972 Stockholm Conference, where it was first given a global focus. On the other hand, what has changed is the widespread acceptance of the principles underlying sustainable development. While it is true to say that we have some distance to go before our economic activities are truly sustainable, we are no longer selling the concepts to a mostly sceptical audience. For the most part, our efforts are focused on the details of integrating the environment into the economy — how much we have to do, what are the best ways to do it, and how quickly it has to be done.

The Stockholm Conference, and the resulting United Nations Declaration, was the first major international step toward defining a goal and outlining national responsibilities toward sustainable development. Yet, sustainable development as a principle underlying environmental policy was one of the many competing philosophies of the time. Other philosophies, such as "zero growth" also had a following; however, these philosophies were doomed never to achieve universal acceptance because of the barriers they posed to the much-needed development of developing countries. Furthermore, they underestimated the forces of the marketplace and technological development.

Today, there is a broader base of consensus on sustainable development. Governments around the world, in both developed and developing nations, are adopting this principle as a foundation for the development and implementation of environmental policy. Policy and economic decision-makers at all levels of society have endorsed this principle. And there are visible signs of this endorsement: many countries have an environmental assessment and review process that officially recognizes the responsibility to sustain environmental quality, and environmental strategies based on the concept of sustainable development are being introduced by governments across the world. Environmental issues have moved into the central political agenda of many countries, and increasingly the nations' leaders are becoming spokespersons for environmental issues.

In Canada, the environment has become an issue in budget papers and throne speeches, a topic of discussion and research by think tanks, and an issue to be included in the mandates of royal commissions. The 1985 *Report of the Royal Commission on the Economic Union and Development Prospects for Canada* (the Macdonald Commission), for example, highlighted some of the issues to be addressed if Canada was to achieve environmentally sustainable development.

Over the years, many important studies and inquiries on particular areas of concern have been produced by government, including the 1985 final report of the Inquiry on Federal Water Policy, entitled *Currents of Change*, and the 1984 Senate Standing

Committee report *Soil at Risk*, which detailed the agricultural problem of soil loss and degradation. The three-part series entitled *Our Changing Atmosphere* produced by the Standing Committee on Environment, and published in 1990 and 1991, made an important contribution to the debate on global warming and other atmospheric pollution issues. One of the Standing Committee's most important recommendations was that the federal government should adopt as its minimum interim objective a 20 percent reduction of human-sourced $CO_2$ emissions by the year 2005 over 1988 levels.

Canada was an active participant in and major financial supporter of the Brundtland Commission. As a response to the Brundtland challenge, the Canadian Council of Resource and Environment Ministers (CCREM), now the Canadian Council of Ministers of the Environment, created the National Task Force on Environment and Economy which confirmed that economic and environmental interests could not continue to operate in isolation. It brought together for the first time environment ministers, business executives, environmentalists and academics. In its report released in 1987, the Task Force made key recommendations including changes to promote informed decision-making, leadership to demonstrate a commitment to environment-economy integration, development of conservation strategies, leadership in the development of international programs and a major communications/public participation program to promote understanding of sustainable development.

An important recommendation of the Task Force was that the Prime Minister and each provincial Premier establish a Round Table on the Environment and the Economy. Round Tables were created to provide a forum for continued dialogue and the formation of new partnerships among traditionally competing interests in each jurisdiction. Canada has now established round tables at the national level and in each of ten provinces and both territories.

The National Round Table on the Environment and the Economy (NRTEE) is composed of senior leaders from all sectors of society. Its focus is evaluating and reporting the effects of policies and decision-making processes on the environment, promoting sustainable development practices in the field of waste management, supporting sustainable development internationally and developing means to communicate principles of sustainable development.

The Government of Canada's substantive response has been the release of a federal sustainable development strategy, *Canada's Green Plan*, on December 11, 1990. Based on the results of extensive cross-country consultation, it recognizes the essential economy-environment relationship and realizes that the well-being of Canadians is dependent on the health of both the environment and the economy.

In Canada, governments have, for the most part, accepted the concept of sustainable development as a basis for a new way of thinking about the environment and the economy. Governments believe that sustainable development is a reasonable, practical and profitable means of orienting Canada's economy because they realize that the environment is not a constraint on economic prosperity; rather, it is an integral part of it.

Sustainable development has provided the impetus for the evolution in Canadian environmental policy over the years, which has increasingly been guided by the principles of anticipation and prevention, an ecosystem approach, increased accountability and interjurisdictional co-operation.

### Institutional Reforms

Canada was the second country to create a federal department of the environment. The Federal Department of the Environment was created in 1971. Today every province has a Ministry of Environment. The two territories, the Yukon and the Northwest Territories, both have Departments of Renewable Resources which incorporate similar responsibilities.

Many of the departments were not created anew but rather they were carved out of existing ministries of natural resources. Duties of these departments were expanded to include not only control of the exploitation of resources, but also control of environmental quality standards. The federal Department of Environment, for example, was formed around the existing Department of Fisheries and Forestry. Since its creation, the Department has undergone many changes with the changing shape and scope of environmental problems. For example, the Canadian Parks Service was added in 1979, reflecting the growing recognition that the preservation of natural landscapes and ecosystems was an environmental goal. Environment Canada's current broad mandate is to preserve and enhance the quality of the environment for the benefit of present and future generations of Canadians.

The roles of environment ministers and their departments have been strengthened over the years. The federal environment minister, for example, is currently a member of key inner Cabinet Committees such as the Priorities and Planning Committee, which determines the federal government's major priority areas. The minister is also a member of the Cabinet Committee on the Environment, created in the late 1980s with a mandate to manage the government's environmental agenda and ensure that policies, programs and other initiatives requiring federal support are fully compatible with the government's environmental objectives. Cabinet or senior-level committees to promote sustainable development have also been established in provinces such as Manitoba and British Columbia.

As the role of environment departments changed, so too did the mandates of the resources departments. Environmental protection has become an issue which cross-cuts departments; accordingly, sustainable development has become a principle underlying action by all government departments.

For example, the concept of sustainable development is an integral part of the Forestry Act, which established Forestry Canada in 1989. The mandate of the department is to foster integrated management and sustainable development of Canada's forest resources. In addition, Forestry Canada applies an environmental assessment to its Federal-Provincial Economic Regional Development Agreements.

Through its Office of Sustainable Development, the Department of Fisheries and Oceans is pursuing, jointly with the provinces and territories, the development of a Sustainable Fisheries and Oceans Policy for Canada. Other Fisheries and Oceans activities related to sustainable development were compiled in one report entitled *A Summary of Sustainable Fisheries Activities in Canada* and released in May 1991.

Increased environmental sustainability is one of the four pillars of the large-scale review of current agriculture policies and programs launched by Agriculture Canada. The report of the Federal-Provincial Task Force on Environmental Sustainability, established to study agricultural policies as they relate to environmental sustainability, concluded that the long-term survival and competitiveness of agriculture in Canada is based on the greater use of more environmentally sustainable practices.

Energy, Mines and Resources (EMR) is currently developing guidelines and principles for the sustainable development of Canada's minerals and fossil fuels. Present EMR sustainable development initiatives in mineral resources include work on the recycling and environmentally responsible management of tailings and effluents. Energy initiatives under development emphasize more efficient use of conventional energy sources and the development of alternative energy sources.

Sustainable development is not just a question of departments dealing with natural resources. It affects all areas of government policy. Accordingly, key initiatives are being carried out throughout the entire government. For example, the Canadian International Development Agency (CIDA) has strengthened its efforts to promote sustainable development by making the environment one of its key criteria for evaluating development assistance proposals. CIDA is also helping to strengthen environmental institutions in developing countries, improve environmental information and increase environmental awareness.

Canada's Department of External Affairs and International Trade has made the global environment one of "the five pillars" of Canada's foreign policy. International environmental issues are handled by the Department's Economic Policy Bureau to co-ordinate the economic and environmental dimensions of Canada's multi-lateral diplomacy.

Canada Mortgage and Housing Corporation (CMHC) is supporting the integrated approaches that link the social, environmental and economic dimensions of development. In its strategy document entitled *Sustainable development: The Urban Dimension*, CMHC examines sustainable development in the context of urban issues. The Department of Health and Welfare Canada is helping fund the "Canadian Healthy Communities Project", which integrates environmental, economic and health concerns to contribute to a growing understanding of the health problems facing Canadian urban areas today. Industry, Science and Technology Canada (ISTC), in exercising its mandate to ensure the competitiveness of Canadian industry, has undertaken a number of environment-related initiatives ranging from a policy on regulatory advocacy, to the development of technology and the environmental industries sector. Supply and Services Canada has established the Papersave Program which collects recyclable office paper from 120 buildings in the National Capital Region. Over 13,000 tonnes of waste paper — equivalent to about 250,000 trees or 560 hectares of forest — were collected through Papersave during the 1990/91 fiscal year.

To move Canada towards sustainable tourism, the federal government released its Policy for Tourism, which has sustainable tourism development as a key objective. In addition, in co-operation with the World Tourism Organization, Canada is sponsoring international seminars and workshops for sustainable tourism development.

One commonly identified barrier to a faster move to sustainable development is the traditional structure of our institutions, that is, jurisdictionally — by federal, provincial, and municipal governments — and by sector — resources, industry and government. Increasingly, however, the issues which we are dealing with are of a horizontal nature, and can be difficult to address within the existing structure of governments at all levels.

An integrated framework is one approach that has been suggested to effectively deal with the issues of increasing globalization, competition and sustainable development, and to ensure consistent and fair protection of the environment. Essential to this approach is the need to enhance the relationship between the various levels of governments.

### *The Federal-Provincial-Territorial Partnership*

In Canada, two levels of government have the major legislative and regulatory authority over the environment, as well as an important leadership role in integrating the environment and the economy. In the Canadian Constitution, the "environment" as such is not mentioned. However, in practice, each level of government has jurisdictional powers which are important for effective environmental management.

Responsibilities are based on the allocation of powers related to the environment. For example, important federal environmental responsibility has been derived from a number of powers, especially related to fisheries, interprovincial and international trade and commerce, criminal law, and peace, order and good government. Key provincial environmental responsibilities derive from, among other things, jurisdiction over the management of resources, property and civil rights, and local works and undertakings. Agriculture in Canada is defined as a shared federal-provincial responsibility.

While the federal-provincial-territorial partnership is effective in some areas, differing views on environmental management and overlapping jurisdiction in policy-making and planning can create difficulties in some circumstances. Provinces and territories do not always agree with the federal government or with each other on environmental or resource management issues, and jurisdictional uncertainties between the federal and provincial governments have on occasion resulted in conflicting objectives and policies. This can be particularly troublesome for industry when trying to deal with conflicting or duplicative demands.

The shared nature of environmental jurisdiction makes close co-operation between the federal, provincial, and territorial governments vital to the success of national environmental policies and objectives. Ministerial councils have been set up to facilitate this co-operation. The Canadian Council of Ministers of the Environment (CCME), for example, composed of federal, provincial and territorial ministers responsible for the environment, is an important institutional response to the division of powers of the environment. Acting as equal partners, ministers use the Council to co-ordinate federal and provincial policies, to resolve interjurisdictional problems, to co-ordinate action on national issues and to exchange information.

To lay the groundwork for ongoing co-operation, the CCME has adopted a Statement on Interjurisdictional Co-operation on Environmental Matters that establishes the overall framework for joint environmental action between the two levels of government. The Statement commits governments to work together to:

- harmonize environmental legislation, policies and programs across jurisdictions;
- develop national environmental objectives and standards in order to ensure that a consistent level of environmental quality is maintained across the country;
- ensure that consistent strategies are developed to address emerging environmental issues of national, international and global importance;
- improve the linkages between domestic and international policies and programs on environmental matters; and

- harmonize environmental assessment and review procedures.

A similar example of intergovernmental partnership is the Western Accord on Environmental Co-operation. Signed on February 20, 1991 by the four western provinces and two territories at a meeting of the Western and Northern Environment and Resource Ministers, the Accord calls for:

- the adoption of the common principles for environmental assessment which were developed by the CCME;
- the pursuit of joint interprovincial and federal-provincial strategies for managing regional environmental issues;
- the harmonization of standards and procedures for environmental protection; and
- the establishment of a priority list of issues requiring immediate attention.

As previously noted, the predecessor of the CCME was the Canadian Council of Resources and Environment Ministers (CCREM). Before that, it was the Canadian Council of Resource Ministers. The Council had its beginnings in 1961 at the Resources for Tomorrow Conference, which recommended that a permanent body be established in the field of renewable resources for consultation among governments. By 1989, when separate councils had been established on forestry and wildlife and the CCREM was dealing mainly with environmental issues, its name was changed to the CCME to more accurately reflect its new focus.

The CCME has spearheaded a number of important actions. For example, in April 1990, it initiated the National Packaging Protocol to reduce waste from packaging by 50 percent in Canada by the year 2000. In November 1990, the CCME released Phase I of the *Management Plan for Nitrogen Oxides and Volatile Organic Compounds*. It has also adopted a list of Co-operative Principles For Environmental Assessment to ensure a consistent and effective process. In addition, a proposed National Action Strategy on Global Warming was released for public comment by the CCME in November, 1990.

To help resolve issues involving natural resources, other federal-provincial-territorial ministerial councils have been established, including the Wildlife Ministers Council of Canada, the Federal-Provincial Parks Council, the Canadian Council of Forest Ministers, Federal-Provincial Agriculture Ministers Conference and the Canadian Council of Energy Ministers. The Wildlife Ministers Council, for example, was instrumental in developing the recently endorsed Wildlife Policy for Canada, which provides a framework for policies and programs affecting wildlife and forms the basis for increased interjurisdictional co-operation.

There are other types of partnerships that have been developed between the federal and provincial governments. For example, the Fraser River Estuary Management Program (FREMP) is a cost-sharing agreement designed to guide environmentally sound development of the Fraser River. The Federal Department of the Environment, the Federal Department of Fisheries and Oceans, Harbour Commissions and the B.C. Department of the Environment are participating. And in Ontario, the second joint federal-provincial Royal Commission ever established is examining sustainable development issues in the Toronto region. The Royal Commission on the Future of the Toronto Waterfront is paying particular attention to the quality of the region's freshwater resources.

### *Environmental Assessment*

An important element of the commitment of governments across Canada is environmental assessment. Environmental assessments have become an essential tool to integrate environmental concerns in decision-making and policy development. Assessments are intended to ensure that environmental impacts are considered as early in the planning process as is practicable. If there are adverse effects, they should be mitigated, and an appropriate balance achieved between social, economic and environmental concerns.

During the last two decades, governments in Canada have established processes to assess the environmental impact of projects and developments under their jurisdiction. Today, all provinces have environmental assessment legislation. Ontario was the first province to enact an environmental assessment process in 1975. This Act is currently under review to reform the process and to provide for broader application. *Newfoundland's Environmental Assessment Act*, introduced in 1980, was the first such piece of legislation to require private sector undertakings as well as those sponsored by government to be subject to environmental assessment. The Yukon has integrated its environmental and economic assessment of projects and a Development Assessment Process. The federal government established the Environmental Assessment Review Process (EARP), a non-legislated process, in 1973. EARP was reinforced in 1984 when the EARP Guidelines Order was issued.

Environmental assessments are beginning to consider cumulative effects. The Province of Saskatchewan and the federal government, for example, are conducting a joint review of the cumulative effects of uranium mining in the province.

Despite these achievements, there are some important outstanding issues, particularly regarding application. For example, recent court decisions have given rise to jurisdictional and legal uncertainties. Legal interpretations of the Guidelines Order by the Federal Court of Canada in the cases involving the Rafferty/Alameda and Oldman dam projects have broadened the application of the federal review process, EARP, beyond what was originally intended when the Guidelines Order was introduced. The Federal

Court also overturned a 1990 federal government Order-in-Council exempting the Kemano Completion Project in British Columbia from an environmental review. The Court ruled that a federal environmental assessment of this project must be done. The situation remains unresolved as the Supreme Court of Canada is currently considering an appeal of an earlier ruling.

Environmental interests view these developments positively, arguing that they remove discretion from the application of the process by the government and ensure an even and consistent application of the process across Canada. Business interests, however, are concerned that these decisions have made the process unpredictable. Business and industrial interests, faced with ongoing uncertainty, are unable to make plans with confidence. As well, there is concern with jurisdictional overlap, which leads to duplication that can be costly, inefficient, and time-consuming.

To improve the environmental review and assessment regime, work is continuing at a number of levels. As discussed earlier, the Canadian Council of Ministers of the Environment has developed *Co-operative Principles for Environmental Assessment*. While there are several unresolved issues, including the scope of federal involvement and equivalency agreements, it represents a sound framework to establish effective, co-operative environmental assessment and reduce the jurisdictional disputes that have characterized a number of applications of the process.

In addition, the federal government, following public consultations in 1988, has brought forward a reform package for EARP. The reforms include a proposed Act to legislate the current EARP. The federal government will be required by law to integrate environmental considerations into all its project planning and implementation. The package provides for the establishment of joint review panels with the provinces when there is overlapping responsibility, and enables the federal Minister of Environment to enter into arrangements with other jurisdictions to facilitate environmental assessment. The Act provides for greater public input at all stages of the process. Participation is encouraged through public hearings, mediation processes, and public registries containing project information. A participant funding program is being established to ensure that stakeholders can participate effectively in this process. The reform package also includes a separate process for the assessment of all policies and programs requiring Cabinet decisions.

Although concerns remain about the proposed reform package, particularly with respect to its scope and application, the federal government is confident that the legislation and its accompanying regulations will ensure a consistent, fair and efficient environmental assessment and review regime.

### *Legislation and Enforcement*

Environmental legislation and regulation have evolved to reflect our increased understanding of pollution and other environmental issues. In the past, laws and statutes related to the environment have tended to be fragmented in their approach to addressing environmental problems. Each piece of legislation would address a certain aspect of environmental pollution in isolation, with few provisions for indirect or long-term environmental impact.

Recent pieces of legislation, such as the *Canadian Environmental Protection Act* (CEPA) are evidence of our new preventative and comprehensive approach to addressing environmental problems. Introduced in 1988, CEPA replaced the Contaminants Act with a "cradle-to-grave" approach to the management of toxic chemicals. CEPA ensures the regulation of toxic substances from development and production through transportation, distribution and usage, to their ultimate disposal. The basic framework of CEPA is identification, assessment and control of substances. The government has established a Priority Substances List containing 44 substances identified as potentially hazardous and in need of assessment. Environment Canada and Health and Welfare Canada jointly assess the impact of each substance on the environment and human health. If a substance is deemed toxic, then the information is then used to develop appropriate controls, including regulations. The controls are supported by comprehensive inspection and enforcement. CEPA includes many of the elements that are indicative of trends in Canadian legislation; that is, better enforcement provisions, improved access to courts, increased public participation, whistle blower's provisions, and innovative mechanisms to promote federal-provincial co-operation.

Much remains to be done under CEPA. Although discussions are underway, important federal-provincial co-operative enforcement agreements have yet to be signed. Sufficient resources will also be necessary for its effective enforcement. As well, regulations are not being developed and implemented as quickly as originally hoped and we are falling behind the targets which we have set for the assessment of toxic substances.

Each province and territory has its own version of an environmental protection act which lays down general parameters for enforcement of air, land and water quality regulations.

Environmental legislation in Canada is placing increasing emphasis on strong enforcement and compliance provisions. Under CEPA, for example punishment may include fines of up to one million dollars a day and imprisonment for up to five years. Also, for the first time, corporate executives can be held accountable and punished for the environmental wrongs of their company. Prince Edward Island also recently amended its *Dangerous Goods Transportation Act* to impose personal liability upon corporate directors for infractions of the Act. Corporate liability helps bring environmental laws to the attention of senior corporate decision-makers. One of the more notable additions to provincial enforcement powers is that of the "superlien", currently found in both Quebec and Ontario, whereby the province can attach a security interest on the contaminated property to guarantee repayment of the clean-up costs that the government incurs. The novelty is that this lien has priority over any and all prior and successive security interests.

Ontario's Municipal and Industrial Strategy for Abatement (MISA), begun in 1986, systematically regulates municipal and industrial discharge. MISA significantly strengthens Ontario's water pollution control efforts by requiring mandatory reporting by municipalities and target industries of their routine discharges and by imposing more stringent, industry-specific discharge standards. MISA forms a major element of Canada's implementation of the *Great Lakes Water Quality Agreement*.

In addition to enhanced government enforcement powers and stricter penalties, other mechanisms such as the "polluter pay principle" are being incorporated into environmental laws, in keeping with the move towards a more proactive policy. This principle is intended to make the polluter bear the costs of measures imposed by public authorities to reduce pollution and to restore the environment to an acceptable state. For example, CEPA, the *Waste Material (Disposal) Act* of Newfoundland, and the proposed Alberta Environmental Protection and Enhancement Act all include provisions in which owners or persons responsible for a release are required to clean it up. If they do not, the government can clean it up and recover its costs. In some cases, the scope of the party responsible for the clean-up may be widened to include past owners, lenders, property managers and executors or administrators for the owner.

The world-wide emergence of environmental concerns, which has resulted in an increasingly active international agenda, has also influenced our domestic legislation. International environmental agreements are a significant source of Canadian environmental legislation and regulation. Agreements on ozone depletion, transboundary air pollutants, and trade in wildlife, for example, require that standards and regulations exist at the national level.

Full implementation of some of these agreements requires new legislation and regulations. For example, regulations are now being drafted to implement the *Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal* which was signed on March 22, 1989. To meet our international obligations under the *Convention on International Trade in Endangered Species (CITES)* we will need legislation forbidding the sale of endangered species or their parts as well as improved enforcement. This should be rectified by the proposed Wild Animal and Plant Protection Act. In addition, although Canada has accepted most of the practical measures of the Law of the Sea Convention, we have, like many other nations, not ratified the Convention and are seeking its universal acceptance.

The overall objective of environmental regulation is to help change behaviour. Some believe that the best way to achieve compliance is through strict and vigorous enforcement of regulations and sanctions, and that governments have not shown enough willingness to use this approach. Others prefer a more co-operative approach. For example, to achieve effective compliance with certain provisions of the Fisheries Act, officials have, where warranted, negotiated informal agreements with polluters, relying on formal sanctions only as a last resort. A balance of the two approaches is needed. Firm, fair and consistent enforcement is essential.

While overall there has been an evolution in attitudes and practices toward implementation of pollution control and environmental protection legislation in Canada, in a few cases there is still some distance to go to achieve effective enforcement and compliance.

### *Environmental Bill of Rights*

Traditionally, individuals have relied on their governments to act in their interests in environmental matters. However, increased public concern for the environment has resulted in a desire for increased public involvement. The possibility of an Environmental Bill of Rights, as a means of guaranteeing public involvement, is a recurring theme. This subject has been addressed in many fora, including the 1972 United Nations Conference on the Human Environment and the 1987 Brundtland report.

In Canada, a number of groups advocate an Environmental Bill of Rights. Certain provinces are responding by incorporating environmental guarantees into their legislation. The Northwest Territories has granted a general power to its residents to protect the environment from the release of contaminants. Quebec's *Environmental Quality Act* of 1972 guarantees its citizens a "right to a clean and healthy environment", although this act is limited to an infraction of the Act itself and does not extend to the public the right to protection against all environmental harm. Ontario is considering an Environmental Bill of Rights and is holding public consultations on such a bill.

There are divergent views about the efficacy of an Environmental Bill of Rights. Individuals who feel disempowered or unable to protect the health and quality of the environment see this as a means of guaranteeing public involvement. However, it is not clear that legislating public involvement in environmental decision-making would help achieve greater environmental protection or that it would provide the most effective forum for public involvement. It may be that these objectives could be better achieved through other means, such as by incorporating environmental guarantees into existing legislation and increasing the level of public consultation.

### *Public Consultations*

There has also been an increased emphasis on consultations as a key input to environment policy development. Over the years, the federal government has taken the initiative with regard to public consultations through such mechanisms as Environment Canada's *Policy for Public Consultations and Information Availability* of 1982, and through much broader reforms, such as the incorporation of consultations as a fundamental principle underlying key pieces of policy and legislation. At the provincial/territorial level, consultations are ongoing on a diverse range of issues, including the development of sustainable development strategies in almost every province and territory.

There are many examples of successful consultations. In 1984, Environment Canada set up a process with the Niagara Institute to encourage multi-stakeholder consultations on issues related to "the environment, economy and jobs". A set of principles and protocols for effective consultation were developed. These dealt with issues such as how the process of consultations should be structured, the manner in which stakeholders should participate, questions of resources, access to data, consensus-building, and implementation. The "Niagara" protocol was used as a basis for national consultations on the development of the Canadian Environmental Protection Act.

Another successful exercise was the "Energy Options" public consultation process which took place in 1987-88 to examine Canada's energy options for the future. This process brought together people from all regions of Canada, representing a diverse group of energy interests, to exchange views on energy choices available to Canadians. Participants included energy producers, representatives from the labour movement, the academic community, public interest and environmental groups, native organizations and government officials.

More recently, public consultations were held across Canada on *The Green Plan*. In total, over 80 percent of the recommendations made at the final session were included in the plan. The *Management Plan for Nitrogen Oxide ($NO_x$) and Volatile Organic Chemicals (VOCs)* to control smog is based on extensive consultation between industry, governments, and non-governmental organizations.

Today, public consultation as a key input to the environmental policy-making process continues to be a top priority. The consultation process is an important vehicle for improving environmental legislation in Canada and is a key aspect of environmental initiatives at both the federal and provincial/territorial levels. Efforts are continuing to ensure that consultation processes provide the public with opportunities for meaningful input on policy development. For example, Canada has launched an innovative consultative process to support the development of national positions in the international negotiations for a climate change convention.

### *Economic Development Policies*

For many years, governments in Canada have designed and implemented policies and programs to encourage economic development and increased prosperity. Though such measures are designed to achieve worthwhile economic and social goals, they may also have significant inadvertent or unanticipated effects upon the environment. For example, governments have developed a number of support mechanisms for the agricultural sector. Unfortunately, some of these have had adverse effects on the environment, such as contributing to both soil erosion and loss of wildlife habitat.

The same may be true for large-scale energy development. For energy policy and regional development reasons, governments at both provincial and federal levels have provided support for a number of projects. But these projects have an impact on the environment, ranging from increased risk of oil spills in marine waters to the loss of traditional aboriginal lands.

On the whole, governments are working to integrate environmental considerations into economic development policies. For example, the Environment Assessment Review Process will be applied to projects and policies at the federal level.

## **International Efforts**

Over the years, the increased international awareness of environmental problems has made international measures a cornerstone of Canada's efforts to protect the environment. Our geography dictates that the United States is our single most important bilateral partner on a wide range of environmental issues. In the area of freshwater, the International Joint Commission (IJC) was established between Canada and the United States in 1909 to deal mainly with the conservation and development of water resources around the Great Lakes. In 1972, Canada and the United States signed the *Great Lakes Water Quality Agreement* to deal with water pollution in the Great Lakes, particularly eutrophication in Lake Erie. In 1978 and again in 1987, the agreement was renegotiated to address the problems of toxic pollution more fully.

The environmental effects on Canada's forests and freshwater lakes of acid rain have been a central bilateral issue in Canada's relations with the United Sates. Ten years of effort by the Canadian government, provincial governments and environmental organizations in Canada and the United States culminated in the *Canada-U.S. Air Quality Accord*, signed in Ottawa in March 1991.

Canadian-U.S. bilateral co-operation in the protection of migratory species dates back to the 1916 *Convention for the Protection of Migratory Birds*. Canada recently entered into a tripartite agreement with the U.S. and Mexico to conserve migratory birds throughout North America.

Several provinces have also entered into agreements with surrounding U.S. states. These agreements have generally addressed transboundary water quality and air pollution. The first such agreement was the *Michigan-Ontario Memorandum of Understanding on Transboundary Air Pollution*, under which Michigan and Ontario agreed to co-operate in their efforts to achieve air quality objectives set by the IJC. Similarly, Quebec and New York state signed an *Agreement on Acid Precipitation* to better monitor and control the damage caused by acid rain. To encourage co-operation in the area of water quality, the bilateral Council of Great Lakes Governors was created in 1983 to promote regional economic development and the protection and enhancement of water resources in the Basin. The council now includes eight U.S. Great Lakes states and the provinces of Ontario and Quebec. And in 1989, New Brunswick, Nova Scotia and the U.S. states of Maine, New Hampshire and Massachussetts signed the *Gulf of Maine Agreement* to, in the words of the agreement, "maintain and enhance marine environmental quality in the Gulf of Maine and to allow for sustainable resources for existing and future generations".

Recognizing the importance of international partnerships to secure solutions to our global environmental problems, Canada has recently implemented measures to promote these partnerships: in 1990, it established the International Institute for Sustainable Development in Winnipeg to promote the integration of sustainable development into decision-making processes on a national and international level, and it was a founding member of the Regional Environmental Centre for Central and Eastern Europe, launched to assist individuals and public and private organizations in Eastern Europe mitigate environmental damage and promote environmental protection. Canada has also established bilateral environmental co-operation agreements with Germany, the Netherlands, and more recently the USSR and Mexico.

Since the 1988 Toronto Economic Summit, Canada has taken a pro-active role on environment issues within the G-7, and has advocated specific initiatives on such issues as marine pollution, sustainable fisheries, improving environmental information and building G-7 support for UNCED. At the suggestion of the Canadian Prime Minister during the 1989 Paris Summit, the G-7 requested the OECD to develop a comprehensive set of environmental indicators for use in evaluating the state of the environment. The first set of indicators was presented at the OECD Environment Ministerial in January 1991.

The Arctic has been a major focus for Canadian environmental co-operation at an international level. Canada and the seven other circumpolar countries have developed the Arctic Environment Protection Strategy. This strategy was confirmed at a Ministerial meeting of the circumpolar countries in Rovaniemi, Finland, in June 1991. The strategy involves measures to protect Arctic flora and fauna, monitor environmental change and conduct joint scientific research. Representatives of indigenous people from the circumpolar countries have been actively involved in this initiative.

Canada has been active in expanding multi-lateral environmental co-operation. For example, Canada was the first nation to ratify the 1985 *Vienna Convention for the Protection of the Ozone Layer*. Canada also played a key part in the development of the 1987 *Montreal Protocol on Substances that Deplete the Ozone Layer*, and was among the first countries to sign the protocol and the first to ratify amendments to it. Canada has committed $15 million over three years to the Montreal Protocol Multilateral Fund, which has been established to help developing countries tackle ozone depletion through technology transfer and financial assistance. The Montreal Protocol Secretariat is located in Montreal.

Canada has also been an active participant in the major environmental conventions and agreements under negotiation in recent years, including the 1989 *Basel Convention on Hazardous Wastes*, the Economic Commission for Europe's *NOx/VOC Protocol* and *Sulphur Dioxide Protocol*, the Convention on Trade in Endangered Species (CITES) and the ongoing negotiations towards a climate change and a biodiversity convention.

Canada also takes part in the exchange of technical expertise and environmental information through organizations such as the United Nations Environment Program (UNEP), the Economic Commission for Europe (ECE), the Organization for Economic Co-operation and Development (OECD), the World Meteorological Organization (WMO) and the Economic Commission for Latin America and the Caribbean (ECLAC).

Canada has given substantial support to the UNCED process itself. We have committed $1.5 million to the UNCED Secretariat to assist its work in preparation for the Conference and to help pay for travel costs to meetings of the Preparatory Committee by delegates from developing countries. Canada is also providing $1.5 million to the Brazilian government and Brazilian non-governmental organizations to assist them in preparing for UNCED.

### *The Canadian International Development Agency*

Environmentally sound development is a priority for Canada's international development assistance efforts. In 1986, the Canadian International Development Agency (CIDA) adopted its Environment and Development Policy, which is currently undergoing a comprehensive review.

Environmental assessment and programming are important concerns of CIDA, and activities in both these areas have increased considerably over the past five years. The Agency has performed mandatory environmental screening of all its bilateral (government-to-government) development projects since 1986. These procedures have also applied to funding for development initiatives by non-governmental organizations and the private sector since 1988. The proposed Canadian Environmental Assessment Act will include regulations specifically governing Canadian official development assistance (ODA) programs.

In addition to screening projects for environmental impact, CIDA has undertaken projects under each of the categories in the 1986 policy. In total, 67 projects directly concerned with the environment have been undertaken since 1986; the value of these projects is $312 million. Another 46 initiatives valued at $311 million have included environmental elements.

CIDA has assisted in preparing national conservation strategies in several countries including Pakistan, Nepal and the Caribbean region. CIDA's program for the Sahel region in West Africa has made ecological stabilization and rehabilitation its overall objective.

CIDA also provides support to both domestic and international non-governmental organizations (NGOs) for environmental activities. The Environment and Development Support Program, of approximately $500,000 annually, was initiated in 1990 to increase the capacity of NGOs in developing countries to promote environmentally sustainable development. Various organizations involved in the preparations for UNCED, both in Canada and in developing countries, have also received support from CIDA, and Canada is assisting Indonesia, Guinee Conakry, Nigeria, Peru and the Central American region prepare National Reports for UNCED.

### Economic Incentives/Disincentives

Environmental degradation is an example of an economic externality. The environment is treated as a free good that can be used by everyone but belongs to no-one. As a result, the classic problem of the "tragedy of the commons" emerges: over the short-term, it appears to be to each economic actor's advantage to use the free good to the maximum extent possible. Over the longer-term, however, this behaviour results in overuse, and ultimately the shortage of the "common good" can become an economic impediment.

With its focus on anticipating and preventing environmental degradation before it occurs, sustainable development means increased emphasis on appropriate pricing to ensure that environmental costs are factored into production and consumption decisions. Looking at a clean environment as a resource which is consumed, economic theory suggests that if it were possible to place a monetary value on the damage to the environment caused by pollution, then an economic incentive, such as an environmental charge or "price", could be established that is equal to that damage.

While attractive in theory, there are many difficulties involved in implementing such an approach. Hence, economic instruments have not been used extensively in Canada. However, they have great potential for achieving socially desirable environmental objectives. They can be directed at pollution prevention, as well as pollution control and can be used to foster substantive change in behaviour towards the environment. Further work must be done to assess the merits of using economic instruments and to discover methods for their effective implementation. The federal government is currently preparing a discussion paper on economic instruments to achieve environmental objectives to stimulate discussion of their use in addressing issues such as climate change and ozone depletion.

Although limited in application, there are some examples of the use of economic instruments for environmental goals. The federal government levies a tax on vehicle air conditioners and on heavy passenger vehicles. Another tax incentive is the accelerated capital cost allowance measures which provide for fast tax write-offs of pollution-control equipment. These measures influence industry views of pollution prevention and control and help determine the types of standards they can achieve.

The provinces have a number of economic incentives that are used for environmental ends. The most widely used economic instruments are deposit-refund systems, principally for some beverage containers. Some user charges also exist. Ontario and British Columbia both levy tire taxes, designed to help pay for the disposal, recycling or re-use of the discarded product. Ontario also imposes a graduated tax on new cars based on fuel consumption, referred to as a "gas-guzzler" tax, and provides a tax rebate for the most fuel-efficient passenger vehicles. And until leaded gasoline was banned on December 1, 1990, the tax imposed on leaded gasoline was higher than on unleaded gasoline at both the federal level and in most provinces to discourage its use.

British Columbia has adopted a fee schedule for ambient, liquid and solid waste for a wide variety of commercial and industrial establishments from dairy farms and dry cleaners to mining and oil refineries. Manitoba has provided for the possible creation of markets for the emissions of specific pollutants. The revenue generated from the sale of emission certificates would then be held in trust for an environmental contingency fund for use in the event of an environmental emergency.

Alberta is now implementing a new rural tax system which incorporates environmental considerations. Tax incentives in Alberta (and in most other provinces) have historically encouraged owners to increase their acreage under cultivation by: clearing land, converting native rangelands to "improved" pastureland, dredging and straightening streams, draining wetlands, or removing fence rows to allow for haying and easy movement of equipment. The Alberta government now believes that greater benefit from these marginal areas can be gained if they are left in their natural state and used for grazing, livestock shelter, woodlots, or wildlife habitat. Under the new approach to rural taxation, assessments are based upon soil capacity, tree cover and subsequent anticipated net income, instead of total acreage under cultivation. Lower tax rates will automatically apply to marginal land because a lower net income is anticipated from it. As a result, landowners will no longer be encouraged by tax advantages to clear or alter marginal areas, and they will have more incentive to reserve marginal land for other productive and environmentally sound uses. Province-wide implementation of this tax system is expected by the end of the 1990s.

Another economic tool used by the Alberta Forestry, Lands, and Wildlife Department is the use of funds from fishing and hunting licences to support habitat preservation and rehabilitation. The program is called Buck for Wildlife, and since 1973 has sponsored tree and shrub planting programs in shelter belts and restored approximately 17,000 hectares of lakes and pond habitat.

Ontario and British Columbia are stimulating the growth in their environmental industries through grants and loans for research and new equipment installations. The provinces have helped plastics companies in their jurisdictions with research and have implemented better source separation and processing technologies for post-consumer plastics. Ontario is also funding a $14 million program to encourage industry to expand waste reduction activities. Ontario is also supporting the development of solidification technologies for hazardous wastes to an extent that they are suitable for less expensive disposal or even utilization.

## Environmental Science and Technology

Over the years, significant scientific progress has been made in areas pertinent to the environment, thereby providing a better understanding and a new perspective of environmental problems. Physical, biological and social sciences have come together to provide a more comprehensive picture of the individual elements that make up the environment and the links between them, as well as the role and influence of the behaviour of humans on the environment. Our approach to solving environmental problems has evolved with our improved understanding of the relationships within ecosystems — from "end of pipe" solutions to more preventative methods.

Advances in science and technology have increased our understanding of and our ability to address specific environmental problems, such as climate change and acid rain. For example, the Long-Range Transport of Air Pollutants Program (LRTAP), which began in 1980, provided us with an understanding of sulphur dioxide emissions, enabling us to devise policies and actions to address this problem. Canada has also been active in research and modelling with respect to climate change, and has developed one of the few global climate models in existence.

Nationally, the federal government has a long record in co-operative environmental research and development. It has worked with provincial and municipal governments, universities, and private sector interests in making a number of technological advances in environmental science including waste recovery and waste reduction, air pollution measurement and instrumentation and effluent treatment.

The federal government is a significant supporter of environmental science and technology in Canada. Through granting councils, it supports university research and it undertakes co-operative programs with provincial and territorial governments and the private sector. The federal government also directly supports the development of environmental technology. For example, Environment Canada's Wastewater Technology Centre (WTC) develops and demonstrates new processes to deal with wastewater produced by industrial processes and municipalities. In 1974, the federal government instituted the Energy R&D Program and formed the intergovernmental Panel on Energy R&D (PERD) to manage it. Through PERD, federal government departments and the private sector work together to develop new environmentally sustainable energy options, better methods of controlling water and air pollution, new waste management techniques, and a clearer understanding of terrestrial and offshore climatic systems. CANMET, a scientific research and development agency, has developed a number of technologies that reduce the environmental impact of energy and mineral production and consumption.

The provinces are supporting the development of remedial technologies to clean up existing environmental damages and preventive technologies to find ways to prevent or reduce pollution. Three provinces — British Columbia, Manitoba and Ontario — have assisted plastics companies install new technologies to foster the development of industries in post-consumer plastic recycling. Agreements with the recycling companies also included contributions from the plastic producers and distributors. In British Columbia, plastics to be collected will include high-density polyethylene containers such as milk jugs, margarine tubs and yogurt cups. These will be processed into pellets for use in manufacturing high-grade, non-food plastic products such as motor oil containers and drainage tiles.

Another technology will be tested in the Vancouver public transit system in 1992. The project will use a Vancouver bus, replacing the vehicle's diesel engine with a series of 20 hydrogen-powered fuel cells. The project is supported by the British Columbia government, B.C. Transit and Energy, Mines and Resources Canada.

Ontario is involved in developing and implementing several new technologies. For example, the Energy Search program is covering about half the cost of a project to develop a water injection system for gasoline powered vehicles. This system could reduce fuel consumption in Ontario by 20 percent and save 1.9 billion litres of gasoline per year. Installation of the water-injection system is expected to cost about $650 per vehicle, and could have a payback period as short as three months for frequently used vehicles . A much larger project, proposed by the Toronto Harbour Commission, involves a $4.3 million pilot project to investigate a new technology to clean up an estimated 2 million tonnes of contaminated soil in Toronto's Port Industrial District.

Joint government-industry scientific research is contributing to finding solutions to environmental problems. For example, the Mine Environmental Neutral Drainage program, funded by the federal and provincial governments and industry on an equal basis, is working towards reducing the environmental impact of sulphur-bearing mine tailings.

Industry, Science and Technology Canada (ISTC) is actively helping industry adapt to the transition to sustainable development. It is promoting the development and application of pollution abatement and new, cleaner, more efficient technologies and processes, and the science required to underpin these developments. The department's St. Lawrence River Technology Development Program, a component of the St. Lawrence River Action Plan, is designed to enhance the development and application of new and improved technologies to reduce water pollution from industrial sources.

The Globe 90 international trade fair and conference held in Vancouver in March 1990 was a pathbreaking initiative in integrating business and the environment. It provided a showcase for many of the most advanced environmental technologies and innovative ideas for sustainable development in the world. It brought together government, industry and environmental groups to identify practical means of meeting our environmental challenges. Over 3,000 representatives from over 70 countries attended Globe 90. This initiative was so successful that a Globe series has been set up with trade fairs and conferences scheduled to take place in Vancouver every two years. The fact that Canada has decided to make Globe a series is a concrete example of how practical solutions are being applied in the area of sustainable development.

Technology is usually regarded as a tool to improve our lives and contribute to environmental solutions. However, in some cases, technology has been a decidedly mixed blessing, revealing serious environmental consequences that were not anticipated. For example, developments in agriculture originally termed the "green revolution" improved food production enormously, allowing some areas of the world to become totally self-sufficient in food production. At the same time, growing reliance on chemical pesticides and fertilizers has contributed to soil erosion and widespread chemical pollution of rivers, lakes, and seas, threatening the food chain itself. The automobile has provided human beings with tremendous personal mobility, but has led to urban congestion, air pollution, and the conversion of huge amounts of arable land to transportation corridors. Fossil fuel utilization has powered the industrialization which lies behind the wealth of developed countries, but threatens the planet with global warming. All have changed our lives for the better, and all have environmental consequences.

The allure of new technology is its prospects for economic return, the promise of environmentally benign substitutes, and the hope for innovative solutions to environmental problems. The challenge of new technologies management is two-fold: to achieve their optimal use in order to derive their economic and social benefits; and to minimize or eliminate any adverse effect upon the environment or human health that might arise from such technologies.

### Environmental Information

Over the years, concern about the environment and the understanding of its importance to human well-being increased rapidly in Canada, increasing the need for reliable information on the impact of our activities on the environment. Good information is essential if we are to avoid a short-term crisis mentality and focus on long-term management of the environment. Environmental reporting — the timely delivery of environmental information — provides objective data on which decisions can be based and on which the decisions of others can be evaluated. Therefore, improving environmental education and information can enhance public awareness, environmental decision-making and help create a better environment.

The concept of state of the environment (SOE) reports emerged in the 1980s as an important instrument to monitor trends in environmental quality and natural resource use, and thus as a valuable source of information. Since then, the collection of environmental and related economic and human health data has increased considerably. The federal government, several provinces and both territories have committed themselves to producing periodic SOE reports.

For the federal government, environmental reporting has now become a legal requirement. For example, CEPA requires that the Government of Canada provide information to the people of Canada on the state of the Canadian environment. In addition, the *Department of Forestry Act* includes as a provision the publication of an annual report on the condition of Canada's forest resources and their contribution to the economy. The first report, *The State of Forestry in Canada*, was released in January 1991. The report presents a combination of factual and analytical information about Canada's forests, and addresses topics and issues important to the future development of the Canadian forest sector. Under the 1988 amendments of the *National Parks Act*, the Minister of the Environment is required to report to Parliament every two years on the State of the National Parks and progress towards establishing new parks. The first State of the Parks Report (1990) has been tabled.

Environmental reporting has also been included in the *Great Lakes Water Quality Agreement* and is part of the EARP reform package, both of which require that reports be published regularly.

The first national *State of the Environment Report for Canada* was published in 1986. It was the first comprehensive evaluation of conditions and trends in the Canadian environment. Using information from a wide variety of sources, this report assessed the degree to which human and natural stresses affect the conditions of our farmlands, forests, water and wildlife. The report also examined the sources and effects of contaminants on human health and the environment as well as government actions taken in response to environmental change. It is expected that the second state of the environment report will be published in 1991. In January 1991, the federal government released the document *A Report on Canada's Progress Toward a National Set of Environmental Indicators* which includes a preliminary set of environmental indicators.

Both Saskatchewan and Manitoba are also mandated by law to produce SOE reports. Manitoba's legislation commits the province to produce a SOE report every two years; the first report appeared in 1991. Although not legally required to do so, Quebec published a comprehensive SOE report in 1988.

Many other provinces do not produce an official SOE report but publish comprehensive reports in specific areas, such as Ontario's *Guide to Eating Sport Fish* or its air quality report. Sometimes, the provinces co-operatively produce reports on the environment through the Ministerial Councils, such as the National Forest Sector Strategy for Canada.

Environmental reporting is not limited to SOE reports; there are also ongoing series and fact sheets focusing on a particular topic or area of interest (i.e. endangered species in Canada, contaminants in seabirds, pollutants in B.C.'s marine environment).

An important function of governments in Canada is to provide consumers with information about the marketplace. As environmental awareness increases, consumers, in search of environmentally-sound products and services, are creating a new, "greener" market. Recognizing the need for standards for environmental labelling and advertising, Consumer and Corporate Affairs Canada, in consultation with private sector interests, has developed guiding principles for such an activity, to avoid ambiguous or controversial claims.

The Environmental Choice program is a Government of Canada program that was first announced by the Prime Minister in June 1988 as a means to help consumers identify products that pose less of an environmental burden. The EcoLogo (three doves intertwined to form a maple leaf) appears on products that meet specified environmental criteria and performance measures, as determined by an independent advisory board. To date, certification criteria have been established for fourteen product categories, including automotive fuels, composting systems for household waste, and re-usable cloth diapers.

Energuide labelling is a means of increasing consumer awareness about energy efficiency. Energuide labels, which indicate the amount of energy used by an appliance, can be found on all new appliances sold in Canada.

Accurate, reliable environmental information is essential to sound decision-making. But this information must recognize the relationship between the environment and the economy. For example, it is recognized that there is a need to adjust national economic accounting practices for environmental impacts. The United Nations, the World Bank and other major multilateral organizations have begun work on such a system.

The main difference between this framework and conventional accounting lies in the introduction of quantified environmental costs of depletion and environmental degradation. Incorporating this type of accounting, known as environmental "satellite accounts", into the national accounts would facilitate the adjustment of key macro-economic indicators, including GNP, National Income, and National Debt, to reflect the costs and benefits of environmental change.

## Environmental Education and Public Awareness

There are numerous examples of federal and provincial initiatives to increase public awareness and education of environmental issues and to stimulate action, both in the formal school system and in less formal settings.

At the post-secondary level, some faculties and departments of environmental studies have been established. York University, in Toronto, established a Faculty of Environmental Studies in 1968. This faculty is now one of the largest in Canada. Seven other universities across Canada have formed Departments of Environmental Studies. In addition, many universities have designed environmental studies programs or individual courses without forming dedicated departments. For example, the University of Manitoba's Faculty of Architecture offers an Environmental Studies Program, Simon Fraser University offers a minor specialization or diploma course in environmental toxicology, and Lakehead University offers a course in environmental assessment. In the Northwest Territories, Arctic College specializes in northern resource management, and the NWT Science Institute promotes both western and traditional environmental science.

Sometimes, local or community action is incited by the actions of elementary school children. For example, an elementary school launched a recycling program in south Winnipeg that was so successful that, when the depot closed at the end of the school year, local citizens petitioned the municipal government to take it over. As a result of this grassroots awareness, there exists a significant degree of environmental awareness across Canada. Many schools and school boards have developed and implemented environmental curriculum. Projects such as recycling, composting, tree planting and clean-up drives organized by students are common in Canadian schools.

The federal environment department has established a Success Stories Bank, an information base of the best illustrations of sustainable development initiatives by business, government and communities. These success stories serve as a catalyst for action by providing all sectors of society with concrete examples of ways to integrate environmental considerations into everyday decision-making. And governments at all levels have produced brochures and pamphlets on a number of subjects, including showing people how to reduce energy consumption and compost waste.

In national parks, national historic sites, and provincial parks, interpreters encourage the public to take an interest in global environmental issues and take action on local issues. Through conducted hikes, evening programs, and other parks programs, environmental educational material reaches millions of Canadians and tourists from other countries.

Environment Week, introduced in 1971, is dedicated to promoting environmental awareness among Canadians. It is held in early June each year to coincide with World Environment Day, celebrated on June 5. Over the years, as environmental awareness has grown, more communities and groups have organized activities for Environment Week, often with financial assistance from the federal government and other sources. Projects have ranged from recycling drives to environmental fairs. National Forest Week, held since the 1920s to celebrate Canada's forests, and National Wildlife week, held to promote Canada's wildlife heritage, annually involve thousands of volunteers.

Environmental achievement awards are another means of increasing environmental awareness. These awards were introduced in 1989 to recognize major environmental achievements and in doing so, encourage other Canadians to do their part. The awards are usually handed out at an Environmental Achievement Awards ceremony, which takes place during Environment Week. Awards are presented to winners in six categories: non-profit organization, outstanding communications for environmental awareness, corporate environmental leadership, environmental leadership by a municipality, environmental science fair project, and lifetime achievement.

## Clean-ups and Remedial Action Plans

Governments play a key role in helping to fix past mistakes. Remedial actions have begun on some of Canada's most pressing environmental problems.

The clean up of the "Sydney Tar Pond" chemical dump site, one of the largest clean-ups of its kind in North America, is currently under way. The "Pond" is a 40 acre, 10 metre thick deposit of contaminated sediments originating from a nearby coke furnace. The sediment contains many different contaminants, including several heavy metals, PCBs and other complex organic compounds. The Pond's contaminants have spread into Sydney Harbour, forcing the closure of the lobster fishery in these waters. With federal-provincial co-operation, an on-site toxic waste incinerator is being constructed that will begin disposal of contaminated sediment in the autumn of 1991.

One of the most successful co-operative action plans is the Canadian Acid Rain Control Program, launched in 1985 by the provinces and the federal government to reduce Canada's contribution to acid rain damage. Under federal-provincial agreements, the seven provinces east of Saskatchewan are implementing abatement programs. The federal government is providing funding to cost-share technology development and demonstration and to assist companies in implementing the specific abatement measures. Sulphur dioxide emissions have fallen dramatically in Eastern Canada and the goal of achieving a 50 percent reduction by 1994 will very likely be achieved.

The Canadian Council of Ministers of the Environment have initiated the National Contaminated Sites Remediation Program, a $250 million program to clean-up high risk "orphan" contaminated sites where contamination poses an existing or imminent threat to human health or the environment. These funds will enable immediate action to be taken where the responsible party is unknown, cannot be located, or insolvent. The former Expo site in Vancouver is the first of the estimated 50 abandoned contaminated sites in Canada to be cleaned up under the program. Alberta and Ontario have also signed federal-provincial agreements for site clean-ups.

Co-operative clean-up of the Great Lakes and the St. Lawrence River has begun. The St. Lawrence has long been polluted, both by contaminants draining from the Great Lakes and from pollution added by cities, industries and farms in Quebec. This river is the source of drinking water for 3 million people and at times sections have been so polluted by raw sewage that there has been a risk of infection. The 1,200 kilometre-long river and its bottom muds are heavily laden with chemicals and it still has high levels of fresh human and animal wastes.

The St. Lawrence Action plan's major objective is to reduce by 90 percent the toxic liquid discharges from the 50 biggest polluters on the river. Action under the plan has already resulted in a significant reduction in liquid toxic waste discharges into the river. The Quebec government has also responded with a $6.2 billion program to build sewage treatment plants along the St. Lawrence and its tributaries. It has also created a St. Lawrence River Clean-up Program to make business development along the river environmentally acceptable.

The Great Lakes Basin is home to 8 million Canadians. In 1985, the federal government and Ontario agreed to a new approach to remediate severely degraded sites around the Great Lakes by developing a Remedial Action Plan (RAP) for each site. There are 17 RAPs in Canada, 12 in Ontario and 5 conducted jointly with the United States on the rivers that connect the lakes. Clean-up plans, with commitments and schedules, are to be finished for Ontario's 12 problem areas by 1993. It is estimated that the clean-ups will cost hundreds of millions of dollars. There are also provincial programs in place to clean up urban and rural beaches and to reduce the impact of pollution from urban and agricultural areas.

To dispose of the bulk of the hazardous wastes produced in Alberta, the Alberta Special Waste Treatment Centre was built as a joint venture between the Alberta Special Waste Management Corporation (a provincial agency) and Chem-Security Limited, the operators of the facility. It is North America's only fully integrated facility capable of treating and disposing of a broad range of highly toxic and hazardous special wastes.

## Local Government Action

Approximately 77 percent of Canadians live in urban centres. Thus, changes made to the urban environment have an important effect on how Canadians perceive their country's environment. Municipalities face many problems that are either the cause or result of environmental deterioration. From the "garbage crisis" and local air pollution to the preservation of greenspace and farmland, environmental issues are forcing municipal governments to re-examine their responsibilities and the structures, systems and programs they have developed.

At the municipal and regional level, citizens' groups are helping to further integrate environmental concerns into urban planning and other forms of local decision-making. The City of Peterborough, Ontario, has established a Sustainable Development Advisory Committee which makes recommendations on municipal policies and programs. Clayoquot Sound, British Columbia, has established a Steering Committee to formulate a community process for creating a local sustainable development strategy. And the nationwide Federation of Canadian Municipalities has issued policy statements and recommendations on issues such as energy conservation, transportation and waste reduction.

Regional initiatives are also attempting to incorporate sustainable development objectives. The Lancaster Sound Regional Land Use Plan in the Northwest Territories, the Meewasin Valley One Hundred Year Conceptual Master Plan and the Eastern Slope Management Plan in Alberta, are examples of multisectoral attempts to integrate environmental and economic issues.

Many municipalities are developing sustainable development strategies or environmental action plans for their specific regions. A multi-stakeholder group including citizens, politicians and government officials helped draft a "greenprint" for the Ottawa-Carleton region. The small Northern Ontario town of Geraldton has produced the *Geraldton Sustainable Community Development Initiative: Planning for the 21st Century*. Originally founded on gold-mining and forestry, the town has had to diversify its economy with the closure of mines and depletion of nearby forests. Now the community has developed a plan to combine creative economic diversification with sustainable management of a demonstration and community forest.

Many municipalities have translated their objectives and goals into action items and set targets. Toronto has committed itself to a 20 percent reduction in $CO_2$ emissions by 2005. As part of its Solid Waste Environmental Assessment Program (SWEAP), Toronto has drafted a regulatory agenda that includes a 50 percent solid waste reduction by 1996. The city's recycling efforts, are already diverting more than 7 percent of the waste stream with 120,000 tonnes of metal, glass, newsprint and plastics being collected from both houses and apartments in 1989. Also, a city by-law, effective in 1991, requires all businesses to recover and recycle CFCs (chlorofluorocarbons), and a pilot project is being implemented to collect CFCs from all discarded refrigerators.

Other cities across Canada are making important contributions. Many communities have established backyard composting and recycling programs. In Ontario alone, more than 2 million households (over half of Ontario's population) now participate in municipal curbside recycling or "blue box" programs, diverting an average of 14 percent of municipal garbage. The regional government of Ottawa-Carleton has just started a 3 year water conservation drive, which includes toilet dams, faucet aerators and reduced summer watering.

The largest Atlantic community, Halifax-Dartmouth, has a long-standing policy of no pesticide use on its municipal lands, and the Halifax Harbour Clean-up Program's goal is to eliminate all raw sewage discharges to waters of Halifax Harbour, thus cutting in half the suspended solids input and reducing the excess nutrient load.

Right-To-Know legislation, concerning the use of pesticides, has been established in several cities, for example, Vancouver, British Columbia, and Dollard-des-Ormeaux, Quebec.

To further integrate environmental concerns into municipal government, several municipalities have formed environment committees or offices. The regional government of Ottawa-Carleton has established an environment committee comprised of regional politicians and an environmental services department. The Toronto Health Department has an environmental division, which currently staffs about 50 environmental health inspectors. In the past, these inspectors were mainly concerned with water, pest, food and sanitation problems, but in recent years they have also investigated chemical risks from lead, PCBs, pesticides and others.

Several municipalities are starting to produce State of the Environment (SOE) reports. For example, in 1987, the School of Urban and Regional Planning of the University of Waterloo produced a State of the Environment report for the Regional Municipality of Waterloo. In 1990, the Task Force on Atmospheric Change from the city of Vancouver produced its final report, *Clouds of Change*.

Many communities are now initiating programs that have a broader approach to community development with long-term objectives of improving the environmental and economic health of the community. One of these programs is Heritage Canada's Main Street Program. The Main Street program works with business people, service groups and citizens to improve the quality of downtown areas by renovating heritage buildings, creating parks, and building stronger links to traditions. Ontario's first Main Street community, the town of Perth, boasts a downtown core of renovated buildings, a park in the centre of town with its own natural swimming hole, and a thriving artisan community which supports a large year-round tourism industry.

Another program being initiated in cities and towns across Canada is the Healthy Communities Project sponsored by the Canadian Institute of Planners, the Federation of Canadian Municipalities and the Canadian Public Health Association. The purpose of the project is to enhance the quality of life for all Canadians by involving municipalities and their citizens in ensuring that health is a primary factor in decision-making. For example, Medicine Hat, Alberta, has established a 13-member Healthy Communities Committee to develop ways to help the community Reduce, Reuse and Recycle. Overall, there are over 100 communities participating in the project, and the provinces of Quebec and British Columbia have formed a network between their communities to facilitate the transfer of experience and information.

## ABORIGINAL PEOPLES OF CANADA

As people who have lived in harmony with nature and close to the land for centuries, aboriginal peoples of Canada have developed an immensely valuable information base and expertise which can be shared with the rest of Canadian society. As long-standing custodians of this traditional knowledge, they can provide detailed information on the workings of natural ecosystems, and can provide a perspective and interpretation on how environmental systems function over time. There is much to be learned from aboriginal peoples, and they recognize their responsibility to make this knowledge known and accessible.

Canada's aboriginal communities have long understood the importance of resource management and environmental stewardship. Native peoples depend upon nature for traditional and commercial activities and cultural well-being. In recent times, however, they have experienced rapid changes that increasingly threaten their natural environment.

Aboriginal peoples are more and more affected by clear-cut logging, new roads, mines, pipelines, hydro-electric development and other development pressures. The land, water and wildlife on some reserves contain high levels of toxic substances.

Historically, aboriginal communities have had little access to decision-making on these issues although they were often the first to be affected. Today, as we become increasingly conscious of the severity of local and global degradation, it is important that all interests converge and work together towards common objectives. Aboriginal peoples are not always opposed to development but must have access to the tools to participate and protect their interests in decision-making processes.

The Canadian constitution recognizes and affirms the existing rights of aboriginal peoples and protects any treaties and land claim settlements reached between government and aboriginal peoples.

In addition, last year the Supreme Court of Canada handed down one of its most important decisions on the scope of aboriginal rights. In a unanimous decision involving the aboriginal fishing rights of the Musqueum Band, the Court confirmed that the federal government has a responsibility to act in a fiduciary capacity to aboriginal peoples in actions by the Crown which may impose constraints on the exercise of aboriginal treaty rights.

These facts, coupled with the general recognition that decision-making should involve people affected by the decisions, have made governments, industry and others aware of the need to work together with aboriginal peoples when their interests converge. Outstanding land claims and other important issues can impede progress in this area, but the need for partnerships with aboriginal peoples in decision-making is widely recognized.

While the slow pace of the resolution of land claims is a major concern to Canada's aboriginal peoples, progress has been made. The federal government has affirmed its commitment to the settlement of land claims, and has had a comprehensive claims policy since 1973 which was made more explicit in the 1981 policy statement entitled *In All Fairness*. To deal with a number of aboriginal concerns, to ensure consistency with other policy positions, particularly on aboriginal self-government, and to expedite negotiations, the Government of Canada adopted a revised *Comprehensive Land Claims Policy* in December 1986. Since 1973; three comprehensive claims settlements (Final Agreements) have been ratified and are currently in operation:

1. the *James Bay and Northern Quebec Agreement (1975)*

2. the *Northeastern Quebec Agreement (1978)*

3. the *Inuvialuit Final Agreement (1984)*

The *Inuvialuit Final Agreement* (IFA) provides a good example of aboriginal involvement in land, resource and environmental management. Some highlights of the agreement are as follows:

- all developments proposed for the settlement region are subject to an environmental impact screening and review process by boards composed jointly of aboriginal and government members;
- granular resources are owned by the Inuvialuit on Inuvialuit lands;
- there is provision for developers to compensate for loss to wildlife harvesting;
- a special Yukon North Slope conservation area and regime has been established;
- an Inuvialuit Regional Corporation and six community corporations have been developed to assist in economic development and to screen and if required, refer proposals for environmental review;
- an Inuvialuit Lands Administration has been established governing land use permits, rights-of-way, commercial leases and concessions.

One important element of the *James Bay and Northern Quebec Agreement* (JBNQA) was the establishment of environmental and social protection regimes set forth in sections 22 and 23 of the Agreement. These regimes are unique in two respects. First, they set out to make the selection process of projects which are subject to environment and social impacts assessments more predictable. Secondly, they recognize the special status and standing of the James Bay Cree and northern Quebec Inuit within the regimes. Although the Agreement has made an important contribution in the recognition and protection of the special rights of the Crees and Inuit, there remain problems in its implementation.

In southern Canada, the federal government has in place the Indian Environmental Partnership Program, a comprehensive environmental strategy that recognizes the special interests of Indian peoples in the environment. To that end, the program will assist communities to develop environmental action plans to respond to environmental crises, undertake environmental assessments, improve living standards on reserve and participate in provincial assessment and regulatory processes. The program will also support the creation of an aboriginal environmental consultation mechanism, the training of Indian administrators, and the development of an inventory of contaminated sites on-reserve.

Aboriginal peoples have an important role to play in wildlife management in this country. The National Wildlife Policy for Canada acknowledges this and calls for effective co-operation between governments and aboriginal peoples in wildlife conservation, research, education and enforcement. In some areas, this is already happening. For example, under the 1984 *Inuvialuit Final Agreement* comprehensive land claim settlement discussed above, a Wildlife Management Advisory Council composed of aboriginal and government members was established to advise on matters related to the management of wildlife and habitat in the Western Arctic.

## THE BUSINESS RESPONSE

Business has played a major role in shaping Canadian society over the last 20 years, and indeed since the early days of Canada. Commercial interests were what first attracted Europeans to the land that was to become Canada. European explorers found in Canada what aboriginal Canadians already knew: Canada's lakes, oceans and lands were brimming with valuable resources.

Industry has benefited from Canada's forests, minerals, energy and other resources to generate the wealth that supports Canada's current high standard of living. The jobs and economic activity spearheaded by this sector have helped to develop an advanced and productive economy, and a society which has the financial, technical and human resources necessary for important social programs. Canadians want their industries to continue to prosper and continue to make Canada a good place to live.

The importance of natural resources to the Canadian economy has also presented industry with challenges. Canadian industry uses the waters, air and land as places to put its unwanted byproducts. While industry is creating jobs and generating wealth, in some cases it continues to overburden the environment through pollution and unsustainable resource management practices.

The heavy reliance of the Canadian economy on its natural resource-based industries makes the move to sustainable development difficult, but at the same time very important. While new facilities in Canada are built to the highest environmental standards, manufacturing plants and facilities in many parts of Canada were built before we were fully aware of all of the environmental consequences of our industrial activities. Adjustment costs for those older plants could be substantial.

However, to ensure the ongoing economic health of our industries we need to ensure the ongoing health of the environment. Our customers, in both our domestic and export markets, are demanding products which are not environmentally damaging, and our need for international competitiveness demands that we use our resources as efficiently as possible. Sustainable development is not a luxury — it is a necessity.

Many Canadian businesses and industry associations have accepted the challenge of sustainable development. And it will be a significant challenge for business to achieve ambitious environmental goals while simultaneously fostering the growth of dynamic and internationally competitive enterprises.

Over the last twenty years we have taken a number of important steps towards implementing sustainable development. On the whole, the trend line in corporate behaviour towards the environment is pointed in an upwards direction. While some business organizations remain reluctant to make changes, Canadian business is recognizing that strict environmental regulations and proactive, voluntary "beyond compliance" business strategies can pay dividends for progressive companies. In addition, environmental protection has opened up whole new markets for a wide range of new products and services. Industry also plays an essential role in the development and dissemination of innovative new technologies that will reduce impact on the environment and help solve past problems.

Two ways in which business is implementing sustainable development are through incorporating environmental factors into their decision-making, and by increasing the environmental content and focus of their interactions with the marketplace, especially through "green marketing" and the development of environmental industries.

## Changes in Corporate Decision-Making

Decision-making in corporate Canada is changing. A central tenet of sustainable development, which was reiterated by the National Task Force on the Environment and Economy in 1987, was that environmental factors must be taken into consideration in economic decision-making of corporate entities. The major ways in which this has been occurring in Canada include changing accounting practices, changing management structures, adopting environmental codes of practice, responding to regulation, performing environmental audits, increased corporate environmental reporting, and actively engaging in public consultations.

### *Accounting and the Environment*

There are signs of change within this area of business activity. Although traditionally conservative, the accounting profession is now asking fundamental questions about the ways by which it has accounted for business activity in the past. For example, the Canadian Institute of Chartered Accountants is developing a methodology for the accounting of environmental liabilities.

### *Changes in Management*

In a number of companies, the environment is everyone's responsibility, right up to the Chief Executive Officer. Some major Canadian companies in the resource and retailing sectors have established environmental subcommittees of their boards of directors. Many have also established Vice-President of Environment positions in their senior management groups. These positions and board committees, coupled with major commitments of human and financial resources, reflect both an internal and an external commitment by companies to improve their environmental performance.

### *Environmental Codes of Practice*

Development of environmental codes of practice is an area in which significant progress has been made. While not every company or industry association has instituted such changes, many have.

By 1991, a number of major industry associations in Canada had established environmental codes of practice to establish industry-wide approaches to environmental practices. One of the better known industry association codes of practice is the Responsible Care Program developed by the Canadian Chemical Producers Association (CCPA). Developed partly in reaction to the Bhopal, India chemical plant accident in 1985, it has subsequently been used as a model for similar chemical industry environmental codes in the United States and Europe. In a commendable example of peer pressure, the CCPA has made adoption of the Responsible Care Program a condition of membership in the Association.

Other industry associations are also forging ahead with environmental codes of practice. For example, the Canadian Petroleum Association is another major organization that has adopted a far-reaching and sensitive environmental code of practice.

Individual companies are also developing codes. For example, the majority of the Big Six banks have an environmental code in place or under development. In addition, companies are participating, through Round Tables and other arrangements, in the development of codes on a broader industrial basis.

### *Environmental Audits*

Environmental audits are playing an increasingly important role in Canadian businesses. They are an important instrument in environmental management and are helping to shape corporate operating policy. Since about 1988, evidence of their growing importance is the emergence of a new industry consisting of firms willing to do environmental audits for client companies. Companies in the mineral extraction, refining, chemical, steel and forest product industries have become major users of such tools.

The International Chamber of Commerce has defined environmental audits as "a management tool comprising a systematic, documented, periodic and objective evaluation of how environmental organization, management and equipment are performing with the aim of helping to safeguard the environment". Different kinds of environmental audits include: waste management audits, corporate greening audits, emissions audits, pre-purchase environmental audits, environmental management audits, compliance audits, and liability audits. The common key to all the audits, however, is their dependence on a well articulated company code of conduct against which auditors can measure the company's performance.

Some large companies have decided to train their own staff to do environmental audits, since both the "training for" and the actual "doing of" the audit are extremely valuable tools for spreading environmental consciousness throughout the company.

### *Corporate Environmental Reporting*

Corporate environmental reporting is another trend that is in its infancy, but growing in sophistication. Leading companies are now producing, or planning to produce, annual reports on their progress in achieving environmental goals. Environmental reports to stakeholders (including employees, governments, lenders, suppliers, customers, shareholders and communities in which companies operate), are analogous to annual financial reports to shareholders and regulatory agencies. On occasion, environmental reports are included in the annual financial report.

Certain progressive companies are making additional strides in generating stand-alone environmental reports. The best reports are the "warts and all" kind which report the bad news as well as the good. A leading example was the *1989 Dow Chemical Environmental Progress Report*. This report included sections on air and water quality, which reported the number of reportable incidents where the company exceeded federal and provincial regulations, and outlined Dow's plans for rectifying these situations. There were also sections on steps the company was taking to protect groundwater and to improve waste management. Dow also reported on both the company-driven, and government-required, environmental assessments the company was involved in over the year.

In 1991, Noranda Forest and Noranda Minerals Inc. produced environmental reports for the first time. These represent the state of the art in environmental reports in Canada and are candid assessments of the company's performance during 1990. They highlight the role that internal environmental audits have played in the environmental reporting process. As the introduction to both reports note, they are not entirely "good news" stories. While the companies use the reports to argue their positions on various controversial issues in the forestry and mining sectors, and to highlight major company accomplishments, they also discuss the pattern of their compliance records over the past several years. These sections typically describe the reasons why compliance is often less than 100 percent, and explain how the company plans to address the problems. The environmental reports also address energy efficiency gains, recycling efforts, environmental R&D programs, land restoration programs, legal issues in which the company is involved, and employee occupational health and safety records, along with employee environmental education and training programs.

### *Responding to Regulation*

A growing body of evidence indicates that for some businesses and industry, environmental regulations are positively affecting their bottom lines. Process modifications to reduce pollution to meet government regulations have at the same time made some industries more efficient in their use of energy and raw materials and enhanced their competitiveness. For example, Inco, a major Ontario smelter, responded to efforts to cut its acid rain-causing sulphur dioxide emissions by completely revamping the way it produces copper and nickel. In the process, it will reduce its energy utilization by about two-thirds and remain the lowest cost nickel producer in the world.

Many argue that stricter environmental regulation and standards stimulate the development of new technologies. This is perhaps why firms in countries like Germany and Japan have become leaders in the export of environmental technology. Canada's resource and manufacturing industries have also developed a wide range of goods and services in response to more demanding environmental regulatory regimes. (see section "The Greening of the Marketplace" below)

### *Participating in Public Consultations*

Canadian business leaders are actively seeking opportunities to sit down with representatives of other sectors to develop workable solutions to environmental problems. Senior officials of Canadian corporations have actively participated in environmental consultation processes in recent years. This includes involvement in government-led consultations such those held on CEPA, in National and Provincial Round Tables, in special multi-stakeholder processes such as the Niagara Process, and in corporate environmental consultations with local communities, environmentalists and employees. Senior officers are increasingly being asked to sit on the boards of environmental groups and industry association committees. Investors, suppliers and journalists are increasingly demanding comments from CEOs and other senior officials on the companies environmental activities.

## The "Greening" of the Marketplace

### *The Bottom Line is Green*

In April 1991, the first commercial Canadian "how-to" book on the greening of business was launched. *Green is Gold* was co-authored by Patrick Carson, the Environmental Vice-President of Loblaws Companies Ltd., a large Canadian food retailing company. The book shows companies how to "green" their organizations, and warns that with the inevitable combination of stricter government regulation and shifting consumer consciousness, they risk imperilling their economic performance by resisting "greening" their operations.

Other reports and publications are being produced which provide advice to companies on how to improve environmental performance, and intelligence on trends in regulation in Canada and abroad (which directly effects Canadian exporters and international competitors). For instance, industry publications are currently informing companies about trends such as: the emergence of environmental bills of rights, including whistle blowing protection for company employees and class action suits by third parties; and, the introduction of market-based instruments such as performance bonds, effluent fees, tradeable emission permits, and deposit refund systems.

In addition to the Inco example discussed above, the Canadian Chamber of Commerce's September 1990 report, *Achieving Environmental Excellence*, reports additional success stories of companies which improved their economic position by achieving a higher level of environmental performance. These firms include Winnipeg Photos Ltd., National Sea Products, The Body Shop, Pur et Simple, and the Raintree Restaurant. A recent Conference Board publication, *Business and the Environment: Economic Benefits from Environmental Improvements*, uses the examples of American companies 3M Inc. and Emerson Electric to make the same point.

### *"Green" Marketing*

Like much of the industrialized world, the Canadian marketplace is signalling a preference for "green" or "environmentally friendly" consumer products. Demands for environmentally friendly products are coming from both the individual consumer market, and the business market. For example, demand for newsprint made from recycled fibre is presenting a major challenge to the Canadian pulp and paper industry. The city of Toronto, for instance, is considering a bylaw that will require all newspapers sold in vending boxes on the city's streets to contain 50 percent recycled fibre. In response to the growing demand, at least ten new de-inking and recycling facilities have been announced by Canadian newsprint producers.

### *Environmental Industries*

The environmental industry sector provides environmental products, services and expertise that have as their effect the conservation, protection, and enhancement of the environment. The sector is now valued at $7 to $10 billion annually and employs, directly or indirectly, about 150,000 people. There are thousands of businesses in environment-related fields, including water and air pollution control, waste disposal, chemical analysis, and environmental information and monitoring systems. Further opportunities exist in such fields as waste storage, recycling, sewage system maintenance and upgrading, and energy conservation and alternatives.

The size and growth rate of the environment industry has given rise to the formation of the Canadian Environment Industry Association. The CEIA represents companies engaged in the environmental industries and should help the industry expand and prosper, with benefits to both the environment and the economy. The Globe '90 Environmental Trade Show, held in Vancouver, B.C., in March 1990, will be held again in 1992, and will provide the Canadian industry with another opportunity to showcase its wares.

## Partnerships

The business community is an essential partner in the search for and implementation of solutions to environmental problems. In this regard, it has taken a number of important steps to work with other stakeholders towards sustainable development. For example, it provides important representation on the national and provincial round tables; participates actively in consultations on a wide range of issues; and takes part in processes such as the federal Pesticide Registration Review.

Business has also provided valuable input into the development of the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer and the National Packaging Protocol to reduce the waste derived from packaging materials.

Industry has established partnerships of all types with the various sectors. Some are operational in nature, such as the Canadian Waste Materials Exchange. This program is a joint government-industry initiative that matches waste-generating industries with industries in need of "waste products" and raw materials. Jointly funded by industry and federal and provincial governments, the program publishes bi-monthly bulletins which lists waste products being offered or required. This program has resulted in innovative and interesting partnerships. As a small but interesting example, the exchange helped a popcorn manufacturer arrange to supply a local pig farmer with up to six cubic metres of waste per week.

Other joint industry-government initiatives include the Blue Box program in Ontario, the $NO_x$/VOCs Management Plan, and a number of funding programs to support wetlands conservation and wildlife habitat protection. And within the UNCED process itself, high level partnerships between the international business community and national governments are exploring new or improved mechanisms for joint business-government exchanges, particularly through the Business Council for Sustainable Development.

In response to a recommendation contained in the report of the National Task Force on the Environment and the Economy, the Business Council on National Issues (BCNI) has created a Task Force on the Environment and Economy. Composed of the chief executive officers of 150 of Canada's largest companies, the BCNI seeks to develop a strategic role for Canada's business leaders in the pursuit of sustainable development, both in Canada and internationally.

## LABOUR

The labour movement has contributed greatly to the development of Canadian society. It has played an important role in empowering individuals through collective action, and has been instrumental at improving the safety, working conditions and standard of living of workers in Canada. Labour unions continue to actively pursue the improvement of working conditions and standards of living of Canadian workers.

Overall, the labour movement in Canada supports a national environmental policy and stringent application of environmental legislation. Labour's main concern with a stricter environmental regime is the potential for job losses. However, the movement believes that although such a regime may cause some job displacement, the overall impact of a move to sustainable development will not be a reduction in the availability of jobs. In fact, some have argued that environmental initiatives will actually create new jobs.

The labour movement in Canada has been actively involved in national environmental issues for a number of years. In 1987, the Canadian Labour Congress (CLC) set up a national Environment Committee. The CLC supports multipartite consultations at the national and provincial levels on environmental issues, and many labour organizations work closely with environmental non-government organizations (ENGOs). Many have established environmental committees, developed policies and assigned full-time staff to the environment file. In November 1990, in Edmonton, the CLC held a National Environment Conference which was devoted to addressing current environmental issues. One of the conclusions was that in the long run, addressing environmental concerns will not result in a net loss of jobs. However, delegates also concluded that the transition to a sustainable economy will not be easy.

Labour consistently puts forward three initiatives for governments to help protect workers and make the transition to a sustainable economy less difficult:

1. develop adjustment initiatives for dislocated workers, including retraining and income security;

2. establish funds for single industry towns which might be adversely affected in the interest of sustainable development; and,

3. legislate "whistle blower protection", or protection for workers who report violations of environmental laws.

## INDIVIDUALS

Twenty years ago, Canadians, like citizens around the world, were becoming more aware of the magnitude of the threat humankind was posing to our natural world. Individual Canadians began adjusting their lifestyles to incorporate more environmentally sustainable behaviour. There was a major burst of interest in recycling newsprint, glass and cans. As well, there was great public interest in energy conservation and the development of renewable sources of energy, largely spurred by the 1973 oil shock.

In the early 1980s, many of these practices began to fade. Recycling programs that had been set up and managed by dedicated volunteers became less popular. There are many reasons for this decline in individual action on the environment: a drop in government funding; a serious economic recession in Canada during the early 1980s; declining energy prices; and demographic trends which saw a large part of the "baby boom" generation abandoning their radical activities for the concerns of home and families. Overall, Canadians' interest in taking action on the environment in their personal lives seemed to have been replaced with other concerns.

Concern about the environment began to pick up again in Canada in the mid-1980s, as reflected in responses to public opinion polls. By the latter part of the decade, professional polling organizations identified the environment as a "core value" about which Canadians were unwilling to compromise. With increased awareness came a resurgence in public demands for recycling and energy conservation programs. By Earth Day 1990, the twentieth anniversary of the first Earth Day, millions of Canadians had made a commitment to alter their own behaviour to protect their environment.

In 1989, the Environmental Partners Fund was set up by the federal government to provide financial resources to help foster community projects to clean up, restore or enhance the natural environment. The Partners Fund is the first environmental program established on the basis of a 50-50 partnership between the federal government and the private sector. Community groups, service clubs, environmental organizations, schools and youth groups can apply to DOE for matching funds up to $200,000 to clean up and rehabilitate the environment at the community level. Industry, municipalities and provincial governments are encouraged to participate, but must designate a non-government, non-commercial group as lead partner. Projects that have received financial aid include wildlife habitat rehabilitation, recycling, composting, conservation, waste disposal/ collection and clean-up.

A recent Statistics Canada survey showed the extent to which Canadians have already incorporated environmentally sensitive behaviour into their lives. The examples cited reflect increased efforts to meet the "four Rs": Reduce, Re-Use, Re-cycle, and Reject. Nearly one-third of Canadian households have installed a low-flow showerhead, designed to save water and energy by reducing the use of hot water. About one-third of Canadians also report that they prefer and purchase paper products made with recycled paper. The survey reported regional differences —for instance, while 21 percent of Canadians take their own bags to the grocery store, the percentage is much higher in British Columbia (30 percent). Of Canadians with a yard or garden, 23 percent compost their organic waste and 52 percent do not use pesticides. Often, the desire to make a difference leads people to join public interest or pressure groups such as environmental non-government organizations, or ENGOs.

## THE ENVIRONMENTAL GROUPS

In 1972, the Canadian landscape was already dotted with citizens' groups dedicated to environmental protection. Many people who were active as individuals in earlier times had banded together to have a greater voice in decisions affecting the environment. Most of those groups established in the late 1960s and early 1970s are still in operation today, and have been joined by a steady proliferation of other groups.

Like the rest of Canadian society, environmental groups reflect a diversity that is both regional and philosophical. Environmental groups in British Columbia are likely to focus on the destruction of old-growth temperate rainforests and grizzly bear habitat, while groups in Toronto are more likely to be concerned with hazardous waste disposal as well as energy efficient public transport.

Citizens groups are often formed because people become frustrated when their individual concerns and efforts have no apparent impact on major decisions that affect their lives. For example, people band together to oppose specific activities, such as chemical spraying near their homes. "Environmentalists" are generally people whose prime motivation is concern for their families' health and safety.

Sometimes such local, single-issue groups are labelled "NIMBY" — meaning "not in my backyard". But concern for their immediate environment does not necessarily differ from the time-worn adage of the environmental movement of "think globally, act locally".

In 1991, there are approximately 1800 environmental groups in Canada. Most are small, local single-issue groups. They operate on small budgets and are usually staffed entirely by volunteers. Each province has at least one "major" group that has a focus on a broader range of issues. Their libraries and staff serve as important resources for the smaller groups. As well, there are over thirty national groups in Canada. The national groups also cover a broad spectrum of interests — from the Canadian Organic Growers Association to Ducks Unlimited to co-operating associations providing volunteers in our national parks (with assistance through the Canadian Parks Partnership). The national groups can generally be sub-divided into a number of major categories: parks, wilderness and wildlife groups, environmental advocacy groups dealing with issues like toxic chemicals and nuclear waste, as well as groups pursuing changes through the courts. All of these groups are linked together through the Canadian Environmental Network.

The Canadian Environmental Network grew out of annual meetings between members of Canada's environmental movement and the federal Minister of the Environment. These meetings began in the late 1970s and were initially hosted by the Minister's statutorily created advisory body, the Canadian Environmental Advisory Council (CEAC). By the 1980s, the value of the interaction between government and environmental groups was sufficiently well established for the federal Department of the Environment to begin independent funding to the environmental groups to communicate among themselves as well as to meet with government. The groups formalized themselves as the Canadian Environmental Network. The CEN acts as a neutral facilitator between and among environmental groups, as well as government. It does not lobby or take positions on issues, but rather provides a process for disparate groups, from large national to small neighbourhood organizations, to meet and develop their views on issues.

Another influential partnership which emerged among Canadian non-governmental organizations was the coalition that came together to produce the Greenprint for Canada. Some 30 environmental, aboriginal and conservation groups banded together to generate their version of a national environmental action plan. (see Section 3, Non-Government Organizations)

In addition to building partnerships among themselves, ENGOs have taken co-operative action with industry and government. For example, in 1986, Canada and the United States signed the North American Waterfowl Management Plan (NAWMP), a $1.5 billion co-operative effort by federal, provincial, territorial, and United States state governments and non-government organizations to restore and enhance waterfowl populations. The main objective of this 15-year plan is to restore declining waterfowl populations to the levels of the 1970s by protecting up to 1.6 million hectares of wetland habitat in Canada.

Over the past twenty years, environmental groups in Canada have had a major influence on a number of important decisions: from the decision to abandon the planned Spadina Expressway in Toronto, to moratoriums on the development of uranium in British Columbia and Nova Scotia, to the establishment of important protected areas like South Moresby National Park in British Columbia and the Grasslands National Park in Saskatchewan. But despite these achievements, many environmentalists remain concerned that fundamental changes in the way we do things as a society, the larger goal of Canada's environmental movement, are slow in coming, and that they do not have an effective voice in the process.

Environmental groups rely on a wide range of tactics in their efforts to influence public opinion as well as government policy. The most readily available and least cost route to public opinion and the government is through the news media. Through demonstrations, conferences, and by publishing research and reports, environmentalists attempt to convey their message. While advocacy through the news media can be effective, environmental groups also find the media often oversimplifies complex environmental issues.

These groups also attempt to reach key decision-makers through direct lobbying. Both provincially and federally, environmentalists meet directly with relevant ministers, present their views and relevant research, and ask for the minister's assistance. Non-government environmental groups are also frequent contributors to legislative hearings, presenting briefs on proposed legislation. They also participate actively in government-sponsored consultation exercises.

Most environmental groups spend a great deal of effort responding to requests for information from the general public. Many perform an informal "hot line" service, answering telephone and mail requests from literally thousands of Canadians annually. Environmental groups also prepare information brochures and publish books dealing with the most frequently asked questions. Public opinion polling consistently shows that environmental groups enjoy significantly higher credibility than government or industry.

Non-governmental groups are also active in public education in Canada. For example, many environmental groups conduct public outreach programs by providing environmental materials and speakers to local groups. They participate in and organize consciousness-raising events such as Environment Week and Earth Day, using those occasions to show Canadians how they can make a difference in protecting the environment.

Recognizing the important role that Canadian environmental groups play, the Department of Environment established a Class Grant Fund, in 1986, which provides for annual distributions of $150,000 in sustaining grants to environmental organizations.

Canadian environmental groups will remain part of the political landscape in Canada for the foreseeable future. They have and will continue to play an important role in the transition to an environmentally sustainable society.

## DEVELOPMENT GROUPS

Canadian development organizations are looking at the underlying causes of environmental degradation and the relationship of northern lifestyles to resource depletion and poverty. They see development as more than economics, recognizing the social, cultural, and traditional values which create sustainable communities. In this context, they are creating strategies for change and evaluating development as it is seen here and abroad.

Since the 1970s, Canadian international development organizations have increasingly integrated environmental concerns in their programs and education. In 1971, the Canadian International Development Agency began the Development Education Animateur Program (DEAP), which was followed by the setting up of learner centres across Canada and the establishment of the Development Education Program, forerunner of the Public Participation Program. By the mid-1970s, overseas programming was emphasizing small, community-based projects, appropriate technology, and long-term development goals. Development education at home was linking major international issues to local concerns, particularly in the areas of agriculture, jobs and the environment.

In the 1980s, Canadian development groups were active in the revision of the World Conservation Strategy, particularly supporting the full integration of women into sustainable development and natural resource conservation. The Report from the World Commission on Environment and Development emphasized the urgent need to rethink development, as did the third Biennial Conference on the Fate of the Earth held in Ottawa, in June 1986.

The mid-1980s saw the development of a Canadian Council for International Co-operation (CCIC) workshop entitled "Towards Sustainable Development" and the beginning of the CCIC Environment and Development Working Group. Later workshops were held to sensitize the NGO community as to the need to incorporate environmental considerations into project design and implementation.

In 1987, development NGOs, represented by CCIC, presented a brief at the Hearings on the Environmental Assessment Review Process recommending full access to information on the environmental impacts of exports to developing countries and a guarantee that environmental standards used on exported resources, science, technology and capital would be the same as those expected at home.

Canadian development NGOs participated in creating the ECE Action Agenda at the "Bridging the Gap" Conference in 1990, attended the Bergen Conference, and are contributing to the NGO Alliance which has come out of that process. They are involved in the Canadian Participatory Committee for UNCED and in a Policy Dialogue with environment and development groups across Canada and in the developing world. Members of the Environment and Development Working Group sit in key positions on the Alliance steering committee and on the International Facilitating Committee as well as on the Board of the Environmental Liaison Centre and in other organizations dedicated to environmentally sound development.

To this end, the development NGO community recognizes the need to work with broader constituencies. Linkages have been established not only between similar groups here and in the developing world (with farmers, foresters, and women for example), but also with social action and environmental groups in Canada. The Environment and Development Working Group has joined with the International Affairs Caucus of the Canadian Environmental Network to share information and develop strategy.

For many years, Canadian churches have been active participants in international development and environmental activities. Many churches collaborate ecumenically on environmental issues through such coalitions as the Taskforce on the Churches and Corporate Responsibility, the Aboriginal Rights Coalition, Ten Days for World Development, Project Ploughshares, the Ecumenical Coalition on Economic Justice, and the Inter-church Fund for International Development. There are also some initial efforts to create an inter-faith dialogue on environmental concerns. Priorities for the Canadian churches also include work related to UNCED. They are co-operating with the World Council of Churches in preparing recommendations about principles which should be reflected in the Earth Charter. On global warming, Canadian churches have provided leadership in bringing together churches from East and West Europe, the United States and Canada, recognizing the responsibility of northern industrialized countries for their contribution to the problem of climate change. Finally, the Taskforce on the Churches and Corporate Responsibility has prepared a brief for the Canadian Council on International Co-operation reflecting on the strategies for dealing with the impact of transnational corporations on environment and development.

Canadian development NGOs are increasingly aware of the need to be engaged in the policy process around development options and strategies. Developing world partners have said that well-designed, environmentally sound grassroots projects fail because of inequitable trade arrangements, economic structures and policies. They have asked Canadian development groups to look at Canada's role in major financial institutions and in structural development projects not only in the developing world but at home, at our own forest policies, pulp mills, hydro-electric projects and coal-fired generators. We are asked to recognize that we live in a global commons and must incorporate environmentally sound development policies accordingly.

## WOMEN AND SUSTAINABLE DEVELOPMENT

Women have played, and continue to play, a crucial role in sustainable development issues. Women's groups have been active in the drive to improve the environmental sustainability of economic development. Some of these groups include the National Council of Women of Canada, one of the first groups to request government action on acid rain, and the National Action Committee on the Status of Women, a major umbrella organization representing more than 500 Canadian women's groups, which has a special subcommittee on the environment. Other organizations include the WEED Foundation (Women and Environments, Education and Development) which sponsored a major conference on women and the environment in 1990 and produces information and educational material, and MATCH International, a group which supports environmental preservation projects in developing countries. In addition, since 1971, the federal government has had a special government department, Status of Women Canada, which is responsible for integrating the concerns of women into the federal government's decision-making process on many issues, including those involving the economy and the environment.

Women's environmental concerns focus on issues which promote health, peace and appropriate uses of technology. Of prime concern to women are the issues of environmental contaminants, occupational safety and health hazards, development of urban and rural communities, and personal safety. Other issues of interest to Canadian women's groups are pesticides, water quality, energy conservation, ozone depletion, nuclear arms, nuclear power, low-level flights, reproductive hazards in the workplace and recycling.

Women have a unique and vital perspective on strategies for achieving sustainable development. They have been exceptionally active and effective at a community level and must be given the opportunity to participate fully in the policy process at every level of decision-making.

## YOUTH

Young people across Canada are a vital part of the country's environmental and development movement. From elementary school to university, young Canadians are increasingly concerned about the planet they will inherit. They demonstrate their concern through school recycling projects, tree planting, eco-fairs, as well as through the participation of young adults in international development assistance. Programs such as Crossroads Canada provide Canadian youth with an invaluable cross-cultural experience in working in developing countries.

Youth have traditionally been involved in environmental issues, but in recent years this interest has increased dramatically. For instance, a high school group in British Columbia has created a national group of high school environmental activists. Environmental Youth Alliance started in the fall of 1989. Within six months, the group had 17,000 members across the country. Through the 1990-91 school year, a group of high school students took the year off from school in order to travel the country, speaking directly to other high school students about the need for action to protect the global environment. Calling their tour "S.A.V.E. — Students for a Viable Environment", they reached over a quarter of a million students. They also researched, wrote, and published a student action guide to environmental issues.

At the university level, students recently organized the "Canadian University Environmental Network". They held their first national conference at Queen's University in January 1991. Over thirty universities sent representatives.

Youth in Canada have been particularly active in preparations for the UNCED conference. The Youth Environment and Development Working Group has been formed to bring together all the interested student organizations. A representative from the Working Group has been included as a member of the Canadian delegation at each of the Preparatory Committee meetings. As well, the working group has a full program of out-reach and education to Canadian youth, as well as an international networking program reaching youth groups around the world. The group is a major participant in over-all NGO activities in Canada as organized through the Canadian Participatory Committee for UNCED.

# SECTION 3: THE PATHWAY TO THE FUTURE

## THE PROMISE OF SUSTAINABLE DEVELOPMENT

Sustainable development offers the promise of economic development without environmental decline. In the words of the Brundtland report, we can achieve "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

Brundtland described sustainable development, in general, as activity in which the environment is fully incorporated into the economic decision-making process as a forethought, and not an afterthought. It holds that resources must be treated on the basis of their future as well as their present value. This approach offers genuine hope of economic development and environmental protection.

In developing countries, economic development is absolutely necessary to meet the legitimate aspirations of the world's population now living in poverty. Yet the globe's diminishing pool of environmental resources will not support more of the resource-hungry kind of prosperity that dominates developed countries.

Although Canada is comparatively well-off, there are segments of the population living below the poverty line and who have legitimate aspirations to improve their economic circumstances. We need to have a robust economy to provide jobs and opportunities for all members of a growing population.

Continued economic development will also help ensure that Canadian society has the resources necessary to maintain services and social programs that Canadians believe are important. Providing these services and programs is costly, and the resources available to governments at all levels — federal, provincial and territorial, and municipal — are limited.

Although economic development is a priority in Canada, it does not mean that we must pursue a path of "growth at all costs" that depletes our environmental resources and that has characterized some of our development in the past. On the contrary, what it means is that while we are pursuing economic development, we should be pursuing environmental protection. It also means that at times, we may have to make tradeoffs between economic activities and environmental protection.

The notion of sustainable development has not been uncontroversial in Canada. During the debate over what sustainable development means, a number of strongly differing views have emerged, each using the concept to reaffirm what they already believe. But despite the wide range of views, the concept has people on all sides of the issue thinking about the same thing, and talking to each other. Sustainable development is a touchstone, a beacon to guide people with divergent views together. It is also a process, with no clear end points and with progress measured in steps.

More and more, Canadian economic policies are encouraging development that fits within the limitations of the natural environment; development that is environmentally sustainable. In Canada, this is the promise of sustainable development — development that provides jobs and opportunities, but development that also protects and enhances the environment for future generations of Canadians.

## THE BASIC CAUSE OF ENVIRONMENTAL PROBLEMS

If we are to achieve sustainable development, we must first understand the origins of environmental problems and why many of our economic activities have been unsustainable in the past. The root cause of environmental problems is faulty or imperfect decision-making at all levels of society.

Canada's economy is shaped by the countless day-to-day decisions taken by Canadians, acting either alone as individuals or within a business, government or other organization. In turn, the flow of energy, materials, and waste set in motion by these decisions determines the impact of our actions on the natural world and, ultimately on our own health and well-being.

The environmental challenges we face exist because we have not adequately taken into account the costs we impose on the environment in the form of pollution, depletion of natural resources, destruction of our ecological heritage, and associated human health problems. The marketplace, for example, does not provide decision-makers with appropriate signals about the value of the environment because most environmental resources are common property. The air we breathe, for example, belongs to everybody, including residents of other countries. Resources which belong to everyone easily become the care of no one. This leads to over-exploitation of natural and ecological resources and the use of the environment as a dump for the wastes of human activities. In short, we have tended to treat our natural environment as a free gift of nature.

This is not because Canadians have been wilfully irresponsible. Our awareness and understanding of the important links between human activity and the environment is only newly-developed — in fact, it is still developing. We are only now accepting that environmental considerations cannot be an afterthought in planning and decision-making. They must form the basis for fundamental change in the way we behave in Canada. They must become part of our consciousness and awareness of the world and how we live in it, and how we go about the activities that make up our lives.

## CANADA'S VISION OF SUSTAINABLE DEVELOPMENT

In Canada, the federal government, provinces, territories, aboriginal peoples, industry, ENGOs and other sectors have produced or are in the process of producing a wide range of documents and other statements which reflect their commitment to sustainable development and the means by which they intend to demonstrate this commitment. These include sustainable development strategies, policy papers, action plans, programs and codes of practice. To include a comprehensive list of all such documents would be a daunting task; rather, we have chosen to highlight some major examples in the following sections.

### Canada's Green Plan

#### *Overview*

*The Green Plan* represents a fundamental shift in the way the Government of Canada looks at economic development and environmental protection. For the first time, the Government of Canada has linked the two in such a way as to try to make them mutually supporting rather than mutually exclusive. Many of the ideas incorporated into *The Green Plan* are not new, having existed since the 1972 Stockholm Conference, and reiterated and fleshed out by Brundtland. But the efforts to make them a reality in Canada is new, and *The Green Plan* represents an important first major step in this direction.

*The Green Plan* was born out of an extensive, national multi-stakeholder consultation process that began with the March 29, 1990 release of the discussion document *A Framework for Discussion on the Environment*. In total, the federal government heard from over 10,000 Canadians during the course of the consultations. Of the 500 plus recommendations coming out of the Green Plan consultations, over 80 percent were incorporated into *The Green Plan*, consolidated into well over 100 specific actions with definite targets and schedules to gauge our success in meeting Canada's environmental goals.

#### *Basic Structure and Contents of the Green Plan*

*Canada's Green Plan* reflects both what we heard from Canadian men and women and the evolution of the government's own policy thinking. It is comprehensive — addressing the range of issues Canadians are concerned about — and corresponds to what we know about ecosystems and the linkages between them. *Canada's Green Plan* articulates a *vision* of Canada's environmental future, outlines the *principles* underlying the vision and lays out a comprehensive national *action plan* to make the vision a reality.

*The Green Plan* is a government-wide commitment, rooted in the knowledge that a concerted effort is essential if we are to solve our complex environmental challenges and implement economic development that is sustainable. It is supported by more than 40 federal departments and agencies. *The Green Plan* is fully funded — the government has committed $3 billion in new funds to federal environmental expenditures over the next six years, adding to existing federal environmental expenditures of $1.3 billion per year.

Although *The Green Plan* marks the end of a long process of thought and consultation, it is also the initiating event in an on-going series of activities and consultations. It is not just a statement of policy, but a flexible, rolling work program. It will be reviewed on a yearly basis for its effectiveness and its relevance, and can be adjusted as necessary to reflect the priorities of Canadians and advances in our scientific understanding of the issues.

### *The Green Plan's Policy Framework — Changing Decision-Making*

A common theme running through both Brundtland's strategy for sustainable development and the report of the National Task Force on Environment and Economy (NTFEE) was the need to integrate economic and ecological considerations in decision-making. The Brundtland Report concluded that to accomplish this, a change in attitudes, objectives and institutional arrangements would be required on every level. One of the main recommendations in the NTFEE's report, issued in September 1987, was a call to integrate the environment and the economy through improving decision-making.

*The Green Plan* was developed in such a way as to build on the convergence of the views of these two pivotal works and the government's own diagnosis of environmental problems as flawed decision-making. It was the government's aim to incorporate many of the ideas and recommendations from both of these works into the development of the federal government's action plan for sustainable development. As a result, changing decision-making became the key concept in the government's environmental policy framework.

The policy framework was developed fairly early in the Green Plan process, and was articulated in the discussion document *A Framework for Discussion on the Environment*, released by the federal government in March 1990. In that document, three basic steps were defined to improve decision-making. First, inputs into decision-making must be improved. Second, decision-making processes and institutions must be changed. And third, we need to strengthen and build partnerships.

## Inputs Affecting Decision-Making

Five key factors will lead us to better decision-making: improved science, more information about the environment, better environmental education, effective laws, and the use of economic instruments.

1. Environmental science and technology provide us with the key tools to identify, understand and resolve environmental problems.
2. Making sound decisions requires good information. Such information can alert us to emerging problems and issues, and contribute to the integration of the economy and the environment.
3. Better environmental education helps to translate environmental information into awareness and then into action.
4. Legislation and regulations, consistently applied and vigorously enforced, establish the rules governing the use of and access to the environment.
5. Increased use of economic instruments helps achieve environmental objectives. Market forces have a powerful influence on the economic activities of Canadians, and that power can and should be harnessed in the pursuit of sustainable development.

## Changing Decision-Making Processes

The second basic step in the Green Plan policy framework to change decision-making is to change decision-making processes. It is not enough to improve the quality and availability of factors that affect decision-making. The existing structures, institutions and processes that use information must also be changed. Environmental considerations must be formally recognized as essential decision-making criteria within government and private sector organizations.

## Forming Better Partnerships

The last basic step in changing decision-making is to form better partnerships to tackle the difficult challenges of implementing sustainable development. The environment is everybody's responsibility. But that responsibility can only be met through co-operative efforts at all levels of society. Just as no single country can resolve the issues of the planet, no single individual, government or business organization can solve Canada's environmental problems.

### Principles for Environmental Action

The Green Plan articulates seven key principles that build on the policy framework. The Government of Canada has adopted these as the basis for its own efforts to secure sustainable development:

- Respect for Nature,
- the Economy-Environment Relationship,
- Efficient Use of Resources,
- Shared Responsibility,
- Leadership,
- Informed Decision-Making, and
- Ecosystem Approach.

### The National Action Plan

The Green Plan contains over 100 specific initiatives to help achieve Canada's national environmental goals and targets, as set out in Table 4. Highlights of these initiatives are set out in Table 5.

## TABLE 4

## GREEN PLAN GOALS AND TARGETS

| GOALS | TARGETS |
|---|---|
| 1. **Clean Air, Water and Land** | ° Assurance that citizens today and tomorrow have the clean air, water and land essential to sustaining human and environmental health.<br>° Protection and enhancement of the quality of our water resources and promotion of the wise and efficient use of our water.<br>° Virtual elimination of the discharge of persistent toxic substances into the environment.<br>° Canada-wide reduction of the concentration of ground-level ozone (smog) to below the threshold of health effects in the most susceptible segments of the population.<br>° A 50-per-cent reduction in Canada's generation of waste by the year 2000. |
| 2. **Sustainable Use of Renewable Resources** | ° The shifting of forest management from sustained yield to sustainable development.<br>° Maintenance and enhancement of the natural resources that the agri-food sector uses or affects, and integration of environmental, economic and social factors.<br>° Long-term sustainability of our fisheries resource. |
| 3. **Protection of Our Special Spaces & Species** | ° The setting aside of 12 per cent of the country as protected space.<br>° Completion of the national parks system by the year 2000.<br>° Maintenance and enhancement of the health and diversity of Canada's wildlife and plants.<br>° Commemoration and protection of our historical heritage. |
| 4. **Preserving the Integrity of the North** | ° Preservation and enhancement of the integrity, health, biodiversity and productivity of Canada's Arctic ecosystems. |

## TABLE 4

## GREEN PLAN GOALS AND TARGETS

| GOALS | TARGETS |
|---|---|
| **5. Global Environmental Security** | ° Stabilization of carbon dioxide and other greenhouse gas emissions at 1990 levels by the year 2000.<br>° Phasing-out of CFCs by 1997, and of methyl chloroform and other major ozone-depleting substances by the year 2000.<br>° A 50-per-cent reduction of sulphur dioxide emissions in eastern Canada by 1994. Capping of acid-rain-related emissions in eastern Canada beyond 1994. Establishment of a national emission cap for the year 2000.<br>° As a cornerstone of Canada's foreign policy, acceleration of global co-operation, understanding and progress on environmental issues. |
| **6. Environmentally Responsible Decision-Making** | ° Strengthening of existing environmental partnerships within Canada, while also building new ones.<br>° Provision of timely, accurate and accessible information to enable Canadians to make environmentally sensitive decisions.<br>° Development of an environmentally literate society_one in which citizens are equipped with the knowledge, skills and values necessary for action.<br>° Strengthening of Canada's environmental science and technology with a special emphasis on understanding regional ecosystems.<br>° Balanced use of strong and effective environmental laws with market-based approaches for environmental protection. |
| **7. Starting in Our Own House** | ° Assurance that the operations and procedures of the federal government exceed national targets and schedules for sustaining our environment. |
| **8. Minimizing the Impact of Environmental Emergencies** | ° Quick and effective response to threats posed by pollution emergencies due to human activity and naturally occuring environmental emergencies. |

## TABLE 5

## HIGHLIGHTS OF THE GREEN PLAN INITIATIVES

| HIGHLIGHTS | RESOURCES (over 6 years) |
|---|---|
| **1. Life's Three Essentials: Clean Air, Water and Land**<br>° The Health and Environment Action Plan<br>° Great Lakes, St. Lawrence and Fraser River Basin Action Plans<br>° National Regulatory Action Plan for Toxics<br>° Smog Emissions Control<br>° National Waste Reduction Plan | **$850 million** |
| **2. Sustaining Our Renewable Resources**<br>° Environmental Sustainability in Agriculture<br>° A National Sustainable Fishery<br>° Partnerships for Sustainable Forestry | **$350 million** |
| **3. Our Special Spaces & Species**<br>° Completing the National Parks Systems<br>° Protecting Historic Heritage<br>° The National Wildlife Strategy | **$175 million** |
| **4. Canada's Unique Stewardship: The Arctic**<br>° The Arctic Environmental Strategy | **$100 million** |
| **5. Global Environmental Security**<br>° The National Action on Global Warming<br>° Ozone Depletion: Accelerating Control Measures<br>° Expanding Acid Rain Controls<br>° Stengthening International Institutions & Partnerships | **$575 million** |

## TABLE 5

## HIGHLIGHTS OF THE GREEN PLAN INITIATIVES

| HIGHLIGHTS | RESOURCES (over 6 years) |
|---|---|
| **6. Environmentally Responsible Decision-Making**<br>° Partnership Programs<br>° Science and Technology Action Plan<br>° Canadian Environmental Citizenship Program<br>° Environmental Information<br>° Effective Regulation<br>° Harnessing Market Forces | **$500 million** |
| **7. Starting in our Own House**<br>° Environmental Assessment<br>° Environmental Stewardship | **$275 million** |
| **8. Emergency Preparedness**<br>° Pollution Emergency Prevention and Response<br>° Natural Emergency Prediction and Warning | **$175 million** |
| **TOTAL** | **$3 billion** |

## Provincial and Territorial Plans

### *Northwest Territories*

In 1988, a Sustainable Development Policy, outlining the principles, guidelines and objectives of sustainable development, was approved by the government of the Northwest Territories following extensive consultations. The policy applies to all decisions and actions of the provincial government related to resource development in the Northwest Territories. To facilitate implementation of the policy, public workshops and meetings will be held. This second phase of consultation will result in the preparation of an action plan to promote sustainable development in the NWT. The action plan, together with the policy, will be known as the NWT Sustainable Development Strategy. The Round Table, established in 1990, will also have a role to play in developing the action plan. Several regional initiatives that are closely related to the strategy are also being developed, including the Inuvialuit Renewable Resource Conservation and Management Plan and the Lancaster Sound Regional Land Use Plan.

### *Yukon*

The *Yukon Conservation Strategy for Our Common Future*, adopted by the Yukon government in 1990, sets out key principles and goals for implementing sustainable development and lists recommendations for government, industry and individuals. Together with the 1988 *Yukon Economic Strategy*, these two plans comprise the territory's sustainable development strategy.

The conservation strategy stresses the need for government, industry and individual action in managing resources and protecting the environment. Objectives outlined in the strategy include: community involvement in resource management decision-making; fostering a stable non-renewable resource sector; understanding and using aboriginal resource management practices; and widening the range of uses of renewable resources. It also emphasizes using the principle of sustainable development to guide management of the Yukon's resources.

The report calls for legislative changes such as a development assessment act and an environmental protection act, as well as departmental action plans across all government agencies, the transfer of federal responsibilities for renewable and non-renewable resources to the Yukon government and completion of regional land use plans. Other activities include settling native land claims, publishing state of the environment and economy reports every five years, and creating an accord on the environment between the federal and Yukon governments.

The recently legislated *Yukon Environment Act*, which embodies the government's commitment to sustainable development, requires that the *Yukon Conservation Strategy* be reviewed and updated regularly.

Each government department is currently developing its own action plan for implementing strategy commitments. Action plans now being finalized by government departments indicate that work is underway on more than 80 percent of the Yukon government commitments in the strategy. Implementation by communities and individuals is being assisted by the government's Yukon Conservation Strategy Demonstration Fund, which provides seed money for conservation projects.

*British Columbia*

The B.C. Round Table recently released a paper entitled *A Better Way* as a first step to creating a sustainable development strategy. The purpose of the paper is to stimulate discussion and encourage individuals to take part in public forums. The paper sets out the principles of sustainable development and the context within which they may be applied in British Columbia. It considers the following principles:

- limiting our impact on the living world to stay within its carrying capacity;
- preserving and protecting the environment;
- holding to a minimum the depletion of non-renewable resources;
- promoting long-term economic development that increases the benefits from a given stock of resources without drawing down on our stocks of environmental assets;
- aiming for a fair distribution of the benefits and the costs of resource use and environmental protection; and
- promoting values that support sustainability.

It also sets out a series of questions to stimulate discussion on ways to bring about sustainable development in British Columbia, particularly with respect to energy, forest, mining, fisheries, agriculture and tourism.

The draft strategy will incorporate the information gathered during the consultations. As a companion to the paper, theme papers are being developed in the following areas: sustainable land use, sustainable communities and sustainable energy.

### *Alberta*

Work began in 1985 on a conservation strategy, through the efforts of a volunteer advisory committee to the Environment Council of Alberta. The *Prospectus for an Alberta Conservation Strategy*, released in 1986, described six objectives which a conservation strategy should embrace. This document was followed by a series of sectoral discussion papers and a draft *Framework for Action* was prepared and published in 1990.

The formal task of preparing a provincial sustainable development strategy was given to the Alberta Round Table on Environmental and Economy when it was established in 1990. The Round Table has examined the work done on the conservation strategy project as well as information from a variety of other sources. To date, the Round Table has focused its efforts on preparing a set of principles and vision elements in support of sustainable development, which have been formally adopted. In the coming months, it will be working to come up with strategies for enroling different segments of society in the sustainable development vision.

In January 1990, the Alberta government presented its environmental vision to the public in a document entitled *Alberta's Environment Toward the 21st Century*. The document explained the government's commitment to achieve the protection, improvement and wise use of the environment through ten environmental principles and thirty-seven policy statements. These principles and policies outline the scope of Alberta Environment's mandate in the protection and improvement of air, land and water. The vision document formed the basis for province-wide consultations and was followed by *Thanks from Alberta's Environment*, which summarized the opinions presented during the consultations. This second report was used to establish a mission statement for Alberta Environment and was fed into the process of updating Alberta's environmental protection legislation.

### *Saskatchewan*

The primary goal of the Saskatchewan Round Table is to develop a conservation strategy which will introduce, explain and promote the concept of sustainable development. The Round Table is currently consolidating into a draft strategy 11 sectoral reports produced by special advisory groups. The reports looked at the current state of each sector, identified how sustainability could be achieved, and examined the potential lifestyle and economic consequences from sustainable development. The draft document, available in the summer of 1991, will be sent out to the public for consultations. A final document, expected to go to Cabinet by the end of 1991, will be built around 7 objectives for conservation and sustainable development as established by the Saskatchewan Round Table, namely to:

- protect primary resources including air, water and soil;
- preserve biological diversity;
- promote and encourage the sustainable use of ecosystems and species;
- efficiently and effectively use and manage non-renewable resources to develop a sound economy without significantly affecting air, water, soil and renewable resources;
- develop an effective strategy to manage and eliminate waste;
- develop a sustainable energy strategy; and
- protect and promote social values, cultural identity and heritage resources.

*Manitoba*

Manitoba's Sustainable Development Strategy includes a core document *Towards a Sustainable Development Strategy For Manitobans*, which provides its framework. A draft of the document was recently released for extensive public consultations. The document presents Manitoba's vision for a sound environment and sustainable economic growth and sets out a list of principles to achieve this vision. The principles include: integration of environmental and economic decisions, stewardship, shared responsibility, prevention, conservation, recycling, enhancement, rehabilitation and reclamation, scientific and technological innovation, and global responsibility. These are supplemented by a number of fundamental guidelines.

The strategy also includes a number of component strategies dealing with issues such as land and water, energy, household and neighbourhood, and market incentive and fiscal policy; each is at various stages of completion. A public sector process for implementing sustainable development has also been developed. This process identifies the strategic organizational structure required to direct, evaluate and monitor the restructuring necessary to guide the transition to sustainable development.

*Ontario*

The Ontario Round Table is preparing a provincial sustainable development strategy which will provide specific goals for government and the private sector. An initial *Challenge Paper* on sustainable development was released in July 1990. The paper comprises two parts.

Part One describes the mission of the Ontario Round Table and discusses the application of sustainable development in Ontario. It also presents the Round Table's six principles which will be used to guide and implement sustainable development, namely: anticipation and prevention, full cost accounting, informed decision-making, living off the interest, quality of development over quantity, and respect for nature and the rights of future generations. The processes for developing the strategy and ways in which people can get involved are also outlined.

Part Two illustrates the application of the principles organized under six topic areas —water, forest communities, food and agriculture, waste, the atmosphere, and cities and towns. Each topic area outlines directions for change, examples of what various sectors and individuals are already doing, and suggested milestones or targets to evaluate future progress.

Public and stakeholder consultations currently underway will lead to the development of a draft strategy paper. Sectoral action plans will also be developed and then consolidated to produce the final strategy, to be released in 1992.

### *Quebec*

In 1989, the Conseil de la conservation et de l'environnement, which reports to the Minister of the Environment, published a document entitled *Les éléments d'une stratégie québécoise de la conservation et du développement*. This document contained general recommendations on the framework for a Quebec conservation and development strategy. Following that report, sectoral reports were published, focusing on the following nine areas: agriculture, energy, wildlife, forestry, environmental education and information, natural areas, industry, tourism, and urban areas. Each publication included a list of recommendations specific to each sector. The recommendations in these reports were based on a lengthy provincial consultation process.

The Quebec Round Table is currently working to integrate these recommendations into a sustainable development action plan for Quebec. The findings of previous consultation exercises, such as the Quebec Round Table's Forum for Sustainable Development, held in 1989, and from the working group created by the Minister of Environment on the demonstration project for the St. Lawrence, will also be incorporated into the action plan.

### *New Brunswick*

New Brunswick released a draft of its sustainable development strategy in April 1991. The draft strategy begins by setting out the five principles which guided its development:

1. The province of New Brunswick will promote development which ensures maintenance of essential ecological processes, biological diversity, and renewable resources at sustainable levels.
2. The province of New Brunswick will ensure that the decision-making process integrates economic and environmental factors.

3. Economic and environmental sustainability must be demonstrated for all major development projects.

4. Non-renewable resources must be managed so that they contribute to the economic and environmental sustainability of future generations.

5. Where possible, renewable resource development should be encouraged over exhaustible non-renewable development.

The strategy outlines its goals and offers a sustainable development model — a schematic representation of sustainable forest planning process. It makes a series of integrated (cross-sectoral) recommendations in the following areas: informed decision-making, education and information, forging partnerships, recognizing responsibilities and leadership roles, waste management and recycling, and energy conservation. The strategy then presents synopses of conditions and public concerns, and specific recommendations in 13 sectors, namely: energy, forestry, mining, agriculture, fisheries and aquaculture, natural areas, wildlife, urban and rural areas, transportation, water/air/land, commerce/service/manufacturing, recreation and tourism, and education/information. The strategy closes with an implementation plan and 21 suggested demonstration projects.

The draft incorporates concerns raised during a first round of public consultations, based on 13 sectoral reports and provides the focus for the second round of consultations. Work on a final strategy has begun, for expected completion by late 1991.

### *Nova Scotia*

The Nova Scotia Round Table is currently in the process of developing a draft conservation strategy expected to be released for public consultation by October 1991. An initial document, *Environment, Economy and You*, was used for a first round of consultations; the document outlined the purpose of the conservation strategy and highlighted major problems or issues of concern. Each section included a series of questions. The feedback was compiled in a summary document, and was used to develop a draft strategy.

The final document is expected to include the following components: fresh water, coastal and marine environment, forest ecosystems, agriculture and food, institutions, energy and transportation, and atmosphere.

### *Prince Edward Island*

The goal of the *Prince Edward Island Conservation Strategy*, adopted as official government policy in 1987, is to ensure that the concepts of sustainable development become an integral part of doing business in the province through proactive environmental management. The strategy asserts that all government departments have a responsibility to ensure that the concept of sustainability is incorporated into their activities. It discusses the highlights and major directions of the plan, then sets out a series of recommendations in the following areas: agriculture, forestry, transportation, fish and wildlife, coastal zone, landscape, land use planning and tourism, waste management and pollution control, education and public awareness, volunteer groups and the role of government.

Implementation of the strategy is currently underway and is the responsibility of the Strategy Coordination Office which in turn facilitates the linkages between departments and other organizations requiring support. Since the strategy's inception, two advisory bodies have been formed — the P.E.I. Round Table on the Environment and the Economy, and the Environmental Advisory Council. In September 1990, the Council released a review of the province's progress on recommendations contained in the conservation strategy. The report concludes that while the province has made significant progress, there is still a long way to go.

Several initiatives have been undertaken in support of the implementation of the strategy including: the Island Conservation Assistance Program, to support environmentally-based community projects; a workshop on erosion control along highways; a young environmentalists' program; a scenic heritage road program; and the *Natural Areas Protection Act*.

In January 1991, the Provincial Round Table released a document entitled *Sustainable Development in Prince Edward Island*. The purpose of the report is two-fold: to define sustainable development within the context of P.E.I., and to promote greater public understanding and awareness of the concept of sustainable development. The report highlights what sustainable development means for key economic sectors, suggests guiding principles in support of sustainable development, and identifies obstacles and potential incentives for each sector. In some instances, local examples of projects that illustrate sustainable development principles are cited.

### *Newfoundland*

The recently established Executive Committee on Sustainable Development, which comprises the Deputy Ministers from the resource departments, will be working together with the Newfoundland Round Table to develop a sustainable development strategy for the province.

## Aboriginal Peoples of Canada

For aboriginal peoples of Canada, sustainable development means planned development that is within the carrying capacities of affected ecosystems, that safeguards the cultures of aboriginal peoples, and respects their rights, values and priorities. It must also be equitable, meaning that it must achieve an adequate measure of social justice through direct participation of aboriginal peoples in all stages of the planning process, including social and environmental impact assessment and monitoring, and ensure that the benefits accrue to these people in a manner acceptable to them.

Aboriginal peoples offer an already tested alternative. While it is true that many of these groups are experiencing a transition into a more cash-oriented economy and, in many cases suffering a breakdown of traditional social structures, they still retain the knowledge and experience of practices which sustained them for thousands of years. If we accept the principle that our continued success as a species depends on our ability to adapt to our environment because the environment will not adapt to us, then we have much to learn from aboriginal peoples.

## Industry

Industry is producing an array of forward-looking 'vision' documents ranging from policy papers dealing with the general concept of sustainable development and its implications for the sector to more specific codes and guidelines.

The Canadian Manufacturers' Association (CMA), for example, has released a document entitled *Sustainable Development: A Policy Paper by the Canadian Manufacturers' Association* which views sustainable development as both a challenge and an opportunity for industry. The CMA recognizes that sustainable development represents a great challenge for industry which will tax its resources and ingenuity. However, sustainable development, described as an evolving process rather than a static concept, also presents industry with a "window of opportunity" to achieve innovative and cost-effective solutions to environmental problems in co-operation with governments and the public. Recognizing that sustainable development will require a commitment from all segments of society, including industry and the public sector, the report outlines a number of corporate and public policies necessary to bring about sustainable development in Canada.

Some important elements of the commitment required by industries include:

- the integration of environmental protection into business planning;
- increased commitment to environmental assessment of projects;

- continued research into products and by-products of manufacturing processes;
- the adoption of environmental policies and codes of practice;
- moving ahead of regulated standards;
- increased use of recycling and re-use of materials;
- adopting the principle of product stewardship;
- adopting a co-operative approach with government; and
- participating responsibly in environmental debates.

Public policies, in turn, should relate to:

- improving science and education to allow for an informed debate;
- adopting a rational process of priority setting to ensure that the most important issues are dealt with first;
- espousing a co-operative approach based on consultation and consensus;
- ensuring that policies are co-ordinated with other jurisdictions, both nationally and internationally;
- establishing an appropriate balance between enforcement and co-operation in pursuing environmental objectives; and
- investigating further the use of economic instruments to complement regulations.

In its policy document entitled *A Healthy Environment and a Healthy Economy: A New Agenda for Business*, the Canadian Chamber of Commerce also looks at the implications of sustainable development for industry. The document, put together by the Chamber's Task Force on the Environment, was produced in response to the recommendation by the National Task Force on the Environment and the Economy that the Chamber "provide leadership to the business community on environment/economy integration". The objective of the report is to promote greater private sector involvement in environmental issues and to communicate the value of environmentally-sound business practices.

Recognizing that sustainable development is now a reality, the Chamber's report urges business to take the necessary action to meet the challenges it presents. The report highlights the need for business to adopt a two-track agenda to sustainable development: continuing to clean up past mistakes, and shifting to an ecologically sustainable economy. It proposes operational changes such as the incorporation of environmental statements and codes, and environmental audits; suggests that business demonstrate leadership through immediate action, while planning for the future though training programs for employees, etc., and urges business to act individually and through partnerships. The report ends with a list of 23 specific recommendations for members of the Canadian Chamber of Commerce.

The Chamber has also prepared an environmental handbook entitled *Achieving Environmental Excellence: A Handbook for Canadian Business*, which provides practical tips to help industry put sustainable development into action.

The Canadian Chemical Producers' Association's Responsible Care Program reflects the association's philosophy of a life-cycle approach to the management of chemicals — from production and manufacturing to use, distribution and disposal.

Subtitled "A Total Commitment," it is designed to encourage responsible care of chemicals and chemical products by way of a statement of guiding principles and established codes of practice for community awareness and emergency response, research and development, manufacturing, transportation, distribution, and waste management. Formal endorsement of the statement of guiding principles and adoption of the codes of practice are conditions of membership in the CCPA. The CCPA has developed an implementation schedule which has a target date for total code compliance of December 1992. The innovative character of the Responsible Care Program has been recognized with awards in Canada and abroad.

The Canadian Petroleum Association has also adopted a code of practice for the industry. The code encourages member companies to strive for high environment performance standards. To supplement the code, the association has updated its *Environmental Operating Guidelines for the Petroleum Industry* and prepared guidelines for environmental audits and public consultation. Its operating guidelines are a compendium of legal, regulatory and technical requirements for environmentally sound practices.

The Mining Association of Canada (MAC) is the world's first national mining body to adopt an environmental policy. The policy consists of six guiding principles which set the framework for how the association intends to work towards the goal of sustainable development in Canada's mining industry. The six principles, which member companies must agree to follow in carrying out their activities in Canada and abroad, deal with compliance, self-regulation, monitoring, research, future laws and communications.

The MAC policy is endorsed by member companies and is a condition of acceptance for new members. In 1990, the Association's membership unanimously adopted a set of guidelines for good environmental practice. These guidelines identify concrete steps that companies should take in implementing the policy and following good environmental management practices.

In June 1989, the Canadian Pulp and Paper Association adopted an environmental statement setting out eight principles governing attitudes and action on environmental matters. Endorsement of the statement is a condition of membership in the Association.

The International Chamber of Commerce formally launched its Business Charter for Sustainable Development in April 1991. Adherence to the Charter's 16 principles of environmental management will assist enterprises around the world fulfil their environmental stewardship in a comprehensive fashion. Canadian business representatives participated actively in the preparation of the Charter, and Canadian enterprises and business associations currently account for over one-tenth of the total endorsements received for the Charter from around the world.

### Non-Government Organizations

Non-government organizations are also releasing plans and strategies which reveal their vision of sustainable development in Canada.

The Canadian Bar Association has adopted a resolution on *Federal Action for Environmental Protection and Sustainable Development*. In this resolution, the CBA confirms its commitment to promoting sustainable development and urges the government to implement a series of measures to promote sustainable development dealing with a broad range of issues including: environmental assessment, access to environmental justice, waste reduction, toxic chemicals and global warming.

The Canadian Bar Association has also contributed to the environmental debate in other ways. It established a committee of 43 participants from across Canada to prepare a report identifying key national and international law reform issues and recommendations to promote sustainable development in Canada. In 1990, the Committee published a report entitled *Sustainable Development in Canada: Options for Law Reform*, containing a series of papers and recommendations calling for more effective government policy and strict enforcement of a tougher set of environmental laws.

Key Committee recommendations include:

- enactment of an environmental bill of rights;

- increased scope of environmental assessment;
- introduction of a strategy to address toxic contamination of the environment;
- increased protection and conservation of water resources;
- reduction of waste by 50 percent during the next decade;
- increased protection of endangered species;
- a leadership role for the federal government in protecting the atmosphere;
- increased control of tanker traffic;
- amendments to pesticide legislation to minimize environmental risks; and,
- protection of the Arctic and the Antarctic.

While never formally adopted by the CBA, the report was an important contribution to the ongoing debate in environmental law.

ENGOs have also released plans and documents which reveal their vision of sustainable development in Canada. In June 1989, *The Greenprint for Canada — A Federal Agenda for the Environment* was released by the Greenprint Coalition. It contains over 40 recommendations in a number of areas of particular concern to the Greenprint coalition. The recommendations fall into two categories:

- Policy and regulatory reforms. These include vigorous enforcement of existing national standards and enactment of new national standards to protect the environment and renewable resources.

- Basic institutional reforms. These include fundamental changes in the federal government's legal and tax structure to address environmental problems.

The focus of the report is mainly short-term, with most of the recommendations calling for government action by 1991-92.

The Greenprint represents a unique co-operative effort by Canada's environmental, conservation and aboriginal communities to develop an environmental action plan for the federal government, and to provide the environmental community with a yardstick against which to judge the government's performance over time. Greenprint represents an important and informed contribution to the discussion of environmental issues in Canada.

In March 1990, the Climate Action Network (CANet-Canada), representing more than 50 environmental groups across Canada, released the *Ten Point Plan for Government Action on Global Warming*. The coalition contends that emissions can be lowered only if we cut fossil-fuel use, promote renewable energy sources and introduce intensive energy conservation practices in industry, business, transportation, and the residential sectors. To bring about these changes the plan recommends ten actions for the federal and provincial governments including upgrading building codes and providing support for energy efficiency and renewable energy. The coalition also calls on federal and provincial governments to work together to monitor and report annually on progress towards lowering emissions and improving energy efficiency.

In December 1988, two environmental groups, the American National Wildlife Federation (NWF) and the Canadian Institute for Environmental Law and Policy (CIELAP) began the Program for Zero Discharge. The purpose of this program is to urge governments to reform laws and regulations to implement zero discharge and the goals of the *U.S.-Canada Great Lakes Water Quality Agreement*. In February 1991, the two groups published *A Prescription for Healthy Great Lakes* which proposes a two-pronged strategy for addressing the toxics problem in the Great Lakes:

1. stopping all future discharges of the most harmful pollutants through a zero discharge program and substantially reducing the discharge of all other chemicals, and

2. cleaning up those contaminants that have been released into the Great Lakes.

The report summarizes the first phase of the program in which possibilities for government program reforms were identified. The report also marks the beginning of the next phase of the program, during which the two groups will be working with other groups and individuals throughout the Great Lakes region to conduct education and advocacy campaigns to promote the recommendations included in the report.

In 1991, the Ontario Environment Network, comprised of environmental groups and organizations in Ontario, released their environmental agenda for Ontario for the 1990s. Called *Sustainability: As If We Mean It*, the report outlines specific initiatives for all sectors and levels of government, in areas such as citizen involvement, environmental assessment, environmental bill of rights, agriculture, forestry, nuclear power and air quality.

## CHALLENGES OF THE FUTURE

Canada faces three important challenges in implementing sustainable development: the need to set priorities, resource constraints throughout Canadian society, and the threat of economic dislocation.

Setting priorities is a complex issue which essentially requires people to make tradeoffs between competing goals and to carefully evaluate risks, costs and benefits. Setting environmental priorities also requires that decisions be made under substantial uncertainty. On many issues, we lack the fundamental scientific and socio-economic knowledge necessary to accurately size up the situation and evaluate options regarding what to do and how far to go.

For example, on global warming, we know that greenhouse gases have been building up in the atmosphere for many years, and that in the absence of any counterbalancing atmospheric affect, the earth will likely get warmer. Although we have made some estimates, we do not know with any certainty how much or when. And perhaps most importantly, we do not know what the costs of global warming will be to the world's inhabitants. If we knew with some certainty what the costs were, and what the risk of incurring them would be, then deciding what to do would be much easier.

Setting priorities has become all that much more important because our resources to address environmental problems are limited. The reality is that governments at all levels, industry, and individuals have limited resources to address environmental concerns. For governments, environmental protection must compete with other pressing issues for resources. And within the resources allocated to the environment, many important issues are pressing for attention. In the end, we will have to make choices, and that will leave some important things undone.

One way that governments in Canada are ensuring that priorities represent the views of Canadians is to involve them in the priority-setting and decision-making process, in particular through consultation. It was previously believed that environmental issues and decisions were primarily technical in nature. It is now recognized that in many cases they are value-based, and on this level, public input is extremely useful. In addition, the Canadian public is becoming more sophisticated and better able to participate in decisions affecting the environment than ever before. This is true both of the general public which is spawning a large number of environmental organizations representing it in various causes, and of industry which, as a result of its growing interest in the issue, is learning to participate more effectively in public debates.

The threat of economic dislocation can be a strong deterrent to taking definitive action to implement sustainable development. Government policies which are put in place to make long-term changes to the economy can create difficult transitional effects over the short-term. A sustainable economy is a stronger economy in the long-term, but getting there may cause some pain. For example, environmental protection policies which benefit Canadians as a whole, may result in the closure of certain manufacturing plants, and increased unemployment in affected communities. Canadian governments, industry, and affected individuals will have to work together to minimize the hardship of moving to an environmentally sustainable economy.

There are equally challenging global issues as well. Canada's efforts, or those of any other country, to achieve sustainable development, will be all for naught unless there is global action. The essential global nature of many of our most pressing environmental problems — from climate change and ozone depletion to biodiversity — means that co-ordinated international action is a necessary condition for bringing about effective solutions to these problems.

The developing world needs technical and financial assistance from the developed world to improve living standards while protecting the environment. New and innovative mechanisms are required to meet these needs — mechanisms that are flexible and give due recognition to the differences in social and economic conditions between developed and developing nations.

At the same time, the developed world needs the co-operation of developing countries to secure workable solutions to global environmental problems. Although the developed world is the major source of many global environmental stresses, it is in the developing countries where, in their pursuit of a higher standard of living, we find the greatest potential for new and growing sources of environmental stresses. This is not to suggest that development should be restricted. On the contrary, economic development will be essential to minimizing these environmental stresses. Rather, it is to point out that the participation of the developing nations is a crucial part of the solution.

We will also have to deal with environmental issues in the context of increasing economic globalization. As trade barriers fall, countries will put greater emphasis on improving their international competitiveness. We will need to demonstrate that concerns about trade, competitiveness and the environment can be resolved in a way that will achieve both high and improving levels of environmental quality, and high and improving standards of living.

Ultimately, the challenge will be to determine the extent to which sustainable development can become a practical reality and tool for reconciling the competing demands of nations and generations on the globe's finite resources.

## CONCLUSION

For generations, Canadian men and women have enjoyed the benefits of clean air, fertile soil, a wealth of mineral and forest resources, plentiful and clean water, and diverse and abundant wildlife. Much of Canada's economic development and material well-being has grown from the application of increasingly sophisticated technology by an increasingly educated workforce to this rich base of environmental resources. Our environmental riches support a high standard of living and quality of life for a relatively small population.

There is mounting evidence, however, that we have not been fully meeting our environmental responsibilities. Pollution of important waterways, smog in our cities, and the contamination of groundwater and soil demonstrate show how rapidly neglect can erode the most bountiful environmental legacy.

Global stresses such as climate change, ozone depletion, acid rain and contamination from toxic chemicals are all signs that our planet is straining to meet the demands placed on it by ever growing human activity around the world.

Canada believes that sustainable development is the key to finding lasting solutions to our environmental problems and those of the globe. It offers the hope of securing long-term economic prosperity while maintaining and enhancing the quality of our environment. It offers the hope of meeting the legitimate economic aspirations of the developing world while protecting the global ecosystem upon which we all depend.

Making sustainable development a practical reality is a challenging task. Fundamental changes in attitudes and actions are necessary. Painful choices will have to be made. Sustainable development does not offer any quick solutions. It is a long-term process of change. Century-old behaviour cannot be altered over night. We must work together to bring environmental considerations into the mainstream of our day-to-day decision-making, individually and collectively.

Change is well underway in Canada. We have seen much progress in the last two decades. This report highlights some of these achievements and summarizes Canada's vision and commitment to sustainable development. At the same time, there are important gaps. We know that these efforts must continue and in some cases be intensified both domestically and internationally.

The United Nations Conference on Environment and Development provides an unprecedented opportunity for the nations of the world to make a common commitment — a commitment to meet the challenge of sustainable development — a commitment to fundamental change.

It will be a test of the will of all nations, for ultimately, as the Brundtland Report notes, "sustainable development must rest on political will".

# ANNEX

## *The National Report Steering Committee*

Canada's National Report was prepared by the Government of Canada, with the assistance of a Steering Committee. The Committee provided input from a number of key sectors of Canadian society and helped guide preparation of the National Report.

Committee members provided channels into the following areas:

- the Canadian Council of Ministers of the Environment (federal, provincial and territorial governments);
- the Round Tables on Environment and Economy (national, provincial and territorial bodies);
- environment, development, labour, youth, women's and other organizations represented through the Canadian Participatory Committee for UNCED (CPCU);
- the indigenous peoples of Canada (through the Assembly of First Nations, the Native Council of Canada and the Inuit Circumpolar Conference); and
- business and industry (through the Canadian Secretariat to the International Chamber of Commerce and the Business Council on National Issues).

The Steering Committee was chaired by representatives of Environment Canada who also provided liaison with other federal government departments and agencies.

The Canadian Participatory Committee for UNCED (CPCU) was formed in the spring of 1990 to provide a meeting place for all the various NGO sectors in Canada with an interest in UNCED. The sectors currently represented include the environmental movement, the development community, indigenous groups, the United Nations Association in Canada, youth, women, labour, inter-faith science/academic and peace.

# LIST OF REFERENCES AND CONTACTS

The following references are a selection of the documents used in the preparation of this report. Documents available to the public are identified with a number in parentheses at the end of the citation. The numbers correspond to the list of sources and contacts which follows. The contact list should facilitate access to these documents, should further information be required. Documents which are out of print or those of a more general nature not specifically intended for public distribution may be accessed from the responsible organization or at libraries.

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